

# COAL AGE

Vol. 1

NEW YORK, NOVEMBER 18, 1911

No. 6

A young engineer, fresh from college, reported to the manager of a small coal company for his first-day's work. The task assigned was to map a virgin-coal acreage, paying particular attention to surveying and plotting the outcrop of the seam.

This youthful graduate hastened to consult his textbook, and found that in running a coal crop, he should—first, "pay close attention to the change in color of the vegetation overlying the outcrop"; second, "observe that the floor of the seam would be marked by iron and sulphur springs along the route." Thus enlightened, the task appeared easy and work commenced.

Suffice it to say—the change in the color of the vegetation was not discernible to human eye, and to judge by the springs on the hillside, the contour following the coal closely resembled a cross-section through the foothills of the Rockies. Not a bit discouraged, although isolated from helpful advice, this engineer (pardon me for calling him such; 'tis an evil custom fostered by our great colleges) totaled all his knowledge on the subject, seasoned the whole with practical common sense, and proceeded to solve the problem in his own way.

Trenches were dug at intervals and the coal partly exposed. Contours were taken above and below the seam and the outcrop satisfactorily plotted.

The lesson was a valuable one and taught our young friend that his textbooks might often prove a help, but not a panacea for all mental ills. He began to realize that his education was just beginning, rather than having been concluded; that theory is essential, but experience is hands and feet to every endeavor.

His next move was to resign as engineer for the company, and accept a job at half the pay, as back-sight on the surveying corps of a larger concern in an older field. Here he associated with men wiser and more experienced than himself; the inspiration and knowledge gained were many times worth the price paid.

Lesson number two was now learned, and was the reverse of his first instruction. It had to do with

experience minus theory. The teachers of this lesson were a few of the doughty sons of toil, who, because they lacked an early mental training, tried to induce the belief that education is purely physical, and that wisdom is never gained from books.

These men showed how to light a gas feeder and then beat it out with their coats; they were apt instructors in methods for opening safety lamps at the face when a naked flame was wanted to light a pipe, and the best part of their time, when not actually drilling or loading, was spent in condemning new laws or devising means to evade company rules that had been designed for their own safety.

And it wasn't the miner alone who taught him lesson number two; there were foremen and superintendents who believed it a crime to spend money grading roads when they might be driven water-level; splitting the air was a perversion, and a Jacob's-staff in the hands of a foreman, so they believed, was sufficient means for setting room and entry centers.

Don't imagine that our embryo engineer failed to discern the fallacy in their reasoning, nor that he neglected to profit by the error of their ways. It was plain to him there was little to choose between the theorist and the practicalist. Both were equally a menace.

The result of these observations led him to conclude that the combination to be sought embraces both book-learning and the wisdom born of practical effort, and that such an education develops a man to his highest capacity, increases his individual power of production and makes him a good companion for himself and others.

The sooner we mix brains and work, the greater will be the advance in coal mining. No matter whether we have come down from the college or up from the mines, the one essential to a prosperous issue is hard-headed common sense. The fellow who tries to get along only with his head or only with his hands, will travel about as fast as an automobile with the engine running and the clutch thrown out.

# Anthracite and Bituminous Mining

By Eli T. Conner \*

Bituminous coal is found in so many States of the Union, under such widely varying physical and geological conditions, that it will be impossible in the space at my command, to discuss more than one or two typical regions. Therefore, in the main, this article will be devoted to those coalfields in which I have had personal experience both in the development and operation of coal mines, and the manufacture of coke.

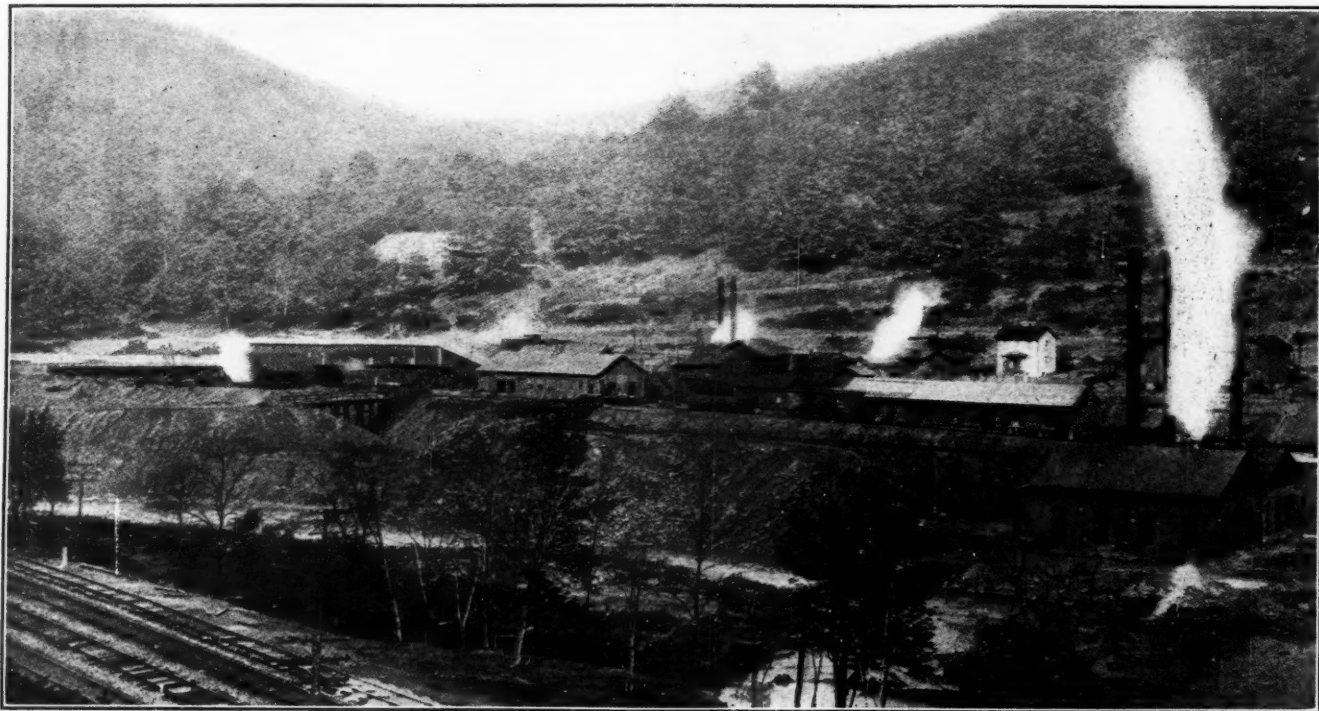
Pennsylvania, the leading State in the production of bituminous coal since the beginning of the industry, has naturally been foremost in the development of mining methods and in the education of all classes of coal-mining employees. In the pursuit of my profession, in many other States, as far west as the Pacific coast, and in the Rocky mountains of British Columbia and Alberta, it has been my good fortune to meet many foremen,

*The central Pennsylvania bituminous field, while advantageously located near tidewater, possesses only thin seams of coal and mining here is commercially precarious. Coal-cutting machines and electric haulage are the most potent factors in securing economy. The fourth of a series of articles by Mr. Conner.*

\*Consulting engineer, Real Estate Trust building, Philadelphia, Penn.

can, as a whole, be described better by men of wider experience in its operation, than has been my own. But in the interest of conservation, I desire to call attention to the most important feature of the mining practice in this region, as quite largely developed in the Connellsville basin.

Here, the original layout and projection of a mine is made with the view of ultimately securing the complete recovery of all the coal. Of course, this is the prime object in all coalfields, but the system of pillar distribution and reclamation of pillar coal, as practiced in the Connellsville field, results in an exceptionally high yield of the mineral in the ground. This is largely due to favorable natural conditions as to thickness and quality of coal, good bottom and the character of the overlying strata, which is of such a nature that generally,



COLLIERIES NOS. 3, 5, 6 AND 8, EHRENFELD, CAMBRIA COUNTY, PENN.

engineers and managers whose early experience was acquired in the Keystone State. The cordial treatment I have received from these men has, perhaps, been due partly to a feeling of sentiment, as well as to business reasons, and remarks have frequently been made expressing pleasure at meeting an engineer from "back home."

This State, therefore, not only deserves credit for its great contribution of natural products to the economic development of the country, but still greater credit for its well trained, resourceful and energetic sons who are helping in the development of newer fields.

## THE PITTSBURG BED

As is well known, the remarkable growth at Pittsburgh of industries of all kinds, but particularly those of steel and iron, has been due almost entirely to the wonderful deposit of high-grade coal, known as the Pittsburgh bed, which is conceded to be in every respect the most remarkable seam of bituminous coal found anywhere in the United States. The physical characteristics of this bed place it in a class by itself, in the matter of economical production. I shall not go into a description of development and mining methods in this bed, because I think it

when pillars are systematically withdrawn the roof breaks properly, with a minimum of pressure on the remaining pillars. I mention these facts particularly because I think the methods that have been developed in the Connellsville field for the reclamation of pillar coal, constitute in the matter of yield almost as high a standard as does Connellsville coke in the market.

What is known as the Central Pennsylvania bituminous coalfield includes part of Center, Clearfield, Cambria, Blair, Somerset, Indiana and Jefferson counties. This field is the nearest of any in the Appalachian Range to tidewater, at New



York, the average distance being 250 miles, which gives it a natural advantage over the other regions that are more favored than this as to geologic and structural conditions. The earlier developments in this region were made in the justly celebrated Moshannon or D bed, in Center and Clearfield counties. The quality of this coal is so good that very shortly after its first exploitation, it established a reputation in the market, which it continues to enjoy. However, most of this high-grade coal has been won and, comparatively speaking, there is but little of it now being produced.

#### MINING IN CENTRAL PENNSYLVANIA

The mining in central Pennsylvania is at present almost wholly in beds B, C Prime, D and E. The average thickness of each of these four seams of coal will not exceed 3 ft. 8 in. Notwithstanding this fact, central Pennsylvania is producing in the neighborhood of 45,000,000

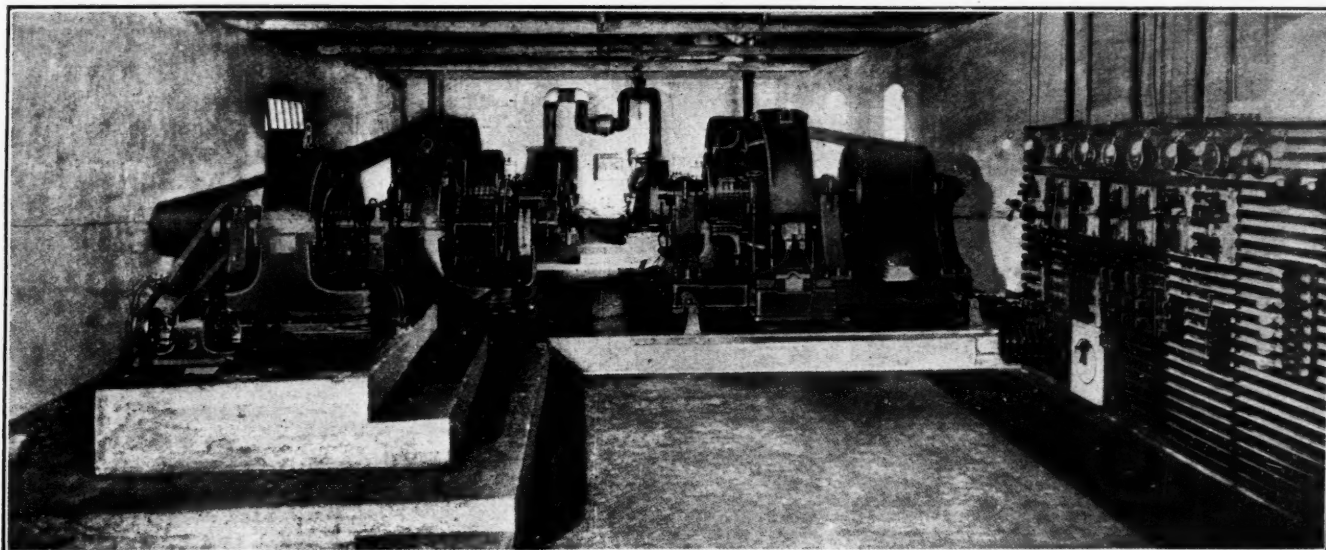
plants of large capacity, constructed on the most modern lines.

Entries are usually driven in pairs, but where the ultimate distance to the boundary exceeds one mile, it has been found necessary to drive three and sometimes four parallel entries in order to provide sufficient area for ventilating purposes, without handling an excessive quantity of rock. In all entry work, in these thin seams, it is necessary to remove a sufficient amount of either top or bottom rock, the choice depending upon their relative character and hardness, to provide a clearance of about 5 ft. 6 in. over the rail. Entries are usually driven 12 ft. wide in the clear, and the best practice is to transport the rock which is removed, to spoil banks on the surface, although it is the custom in some mines to widen the entry in the coal sufficiently to make room for storing the rock removed from the roadway. This latter method I do not consider good practice, as it weakens the

discussed here, and are only mentioned to bring out the point which, in my opinion, has been neglected too long by American engineers, namely, the advantages to be gained by the general introduction of longwall mining in beds of coal under 4½ ft. in thickness.

#### REMOVAL OF ROCK

While there are many mines where it is customary to remove some roof or bottom rock in the rooms to make high for cars and mules, this is not the general practice. It is customary to remove top or bottom rock merely at the entrance to the rooms, and thereafter the only excavation made is in the coal seam proper. The mine cars are usually constructed with a capacity of from 1¼ to 2 tons, and low enough to be handled in openings not exceeding 3½ ft. off the rails. All mine cars are equipped with brakes. The cars are delivered to the room neck, by motor or mule team, and pushed by the



ELECTRIC POWER STATION, PENNSYLVANIA COAL AND COKE COMPANY, No. 10 MINE, GALLITZIN, CAMBRIA COUNTY, PENN.

tons of coal per year. In order to overcome the great handicap of such thin seams as are found in this region, the operators have been compelled to exercise much more ingenuity that is necessary in competing regions where the beds of coal are thicker. The success of these efforts upon the part of central Pennsylvania operators, is deserving of great credit.

As is well known, the coal measures in this region are comparatively flat; pitches rarely exceed 15 per cent., and in most cases are much less. The earlier developments were naturally by drift from the outcrop, and were made by individual operators having comparatively small capital. With the gradual exhaustion of the above-water-level coal, developments have been made on a much larger scale by slopes and shafts, so that at the present time, there are in this region many

entry support and frequently results in falls of roof.

The room-and-pillar method of mining has been adopted almost universally. There is but one instance within my knowledge of consistent effort to introduce the longwall method, and that was at Vintondale, in Cambria county, under the supervision of C. R. Claghorn. This work was done in connection with a conveyer, designed and patented by Mr. Claghorn, which was used for transporting the coal across the longwall face, and discharging it into cars on the butt entries. I was privileged to inspect a mine where this system was in use, and was favorably impressed with its efficacy, particularly with relation to the winning of all the coal on first mining. The details of the system have been described in articles published by Mr. Claghorn and others, so that they need not be

miner and his helper both ways in the room. The compensation for this labor of pushing cars is included in the mining price. This practice of pushing cars is not universal, since it cannot be carried on successfully where the grades exceed 3 or 4 per cent. In such cases, it may be necessary to brush a small quantity of roof rock from over the roadway in order to admit small mules, say 50 to 52 in. in height.

In recent years, small electric locomotives have been put on the market, which are equipped with cable reels and are doing successful work in the matter of gathering from rooms. These locomotives are usually of about four tons weight, and low enough to be used in 3½-ft. openings.

I submit two statements showing in detail the transportation cost at a small bituminous mine where the seam is 4 ft.

thick, and where one side of the mine is operated by electric locomotives and the other side by animal power, from which it will be noted that over 6c. per ton economy is effected by the use of electric locomotives. This does not represent all the economy in this particular instance, since in a number of the rooms

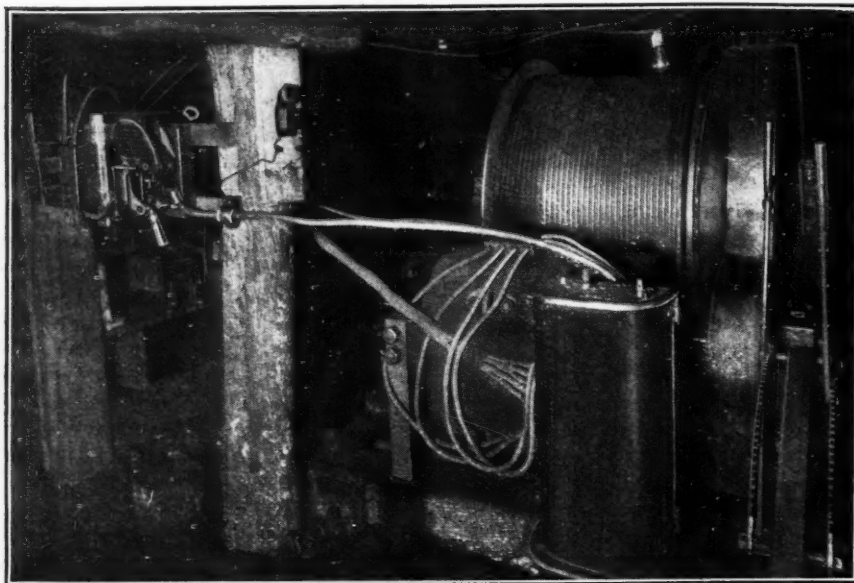
Supplies.....	2.65	0.0006
Power.....	20.00	0.0049
Repairs and maintenance....	7.24	0.0018
Other repairs and maintenance	5.71	0.0014
Interest on investment @ 6 per cent. on \$5000.....	25.00	0.0061
Depreciation, eight years.....	17.71	0.0042

	\$209.83	\$0.0512
Total.....	\$669.55	\$0.1634
Tonnage 4095.10, gathered by mules and hauled from sidetrack by electric motors.		

than 4c. per ton, as compared with ordinary methods of gathering from rooms with mules.

It might be well to state that in the case just mentioned, particular attention was paid to the design and installation of tracks and switches. The track in the entry where the locomotive was used, was of 25-lb. steel rails, properly spliced at joints with fish plates. The switches and frogs were also of 25-lb. rail and designed the same in every way as the switches and frogs on standard-gage railroads. The minimum curve permitted was of 30 ft. radius. The tracks in rooms were laid with 16-lb. steel rail, fish-plated.

Before leaving the subject of transportation, it should be said that most of the important mines in central Pennsylvania have adopted electric transportation on all their main roads and find it profitable to go to considerable expense to grade and aline the tracks properly. One case in particular with which I am familiar, is the main entry in the B or Miller seam, at No. 3 mine, of the Pennsylvania Coal and Coke Company, at Ehrenfeld. Two tracks of 56-lb. rails were laid in this entry for a distance of about two miles, careful attention being paid to proper grade and alinement. On account of this excellent track it is pos-



ELECTRIC HOIST UNDERGROUND AT COLLIERY NO. 3, EHRENFELD

where mules are used there is some cost for removal of roof or floor, to make high, but in compiling these statements, this was not considered.

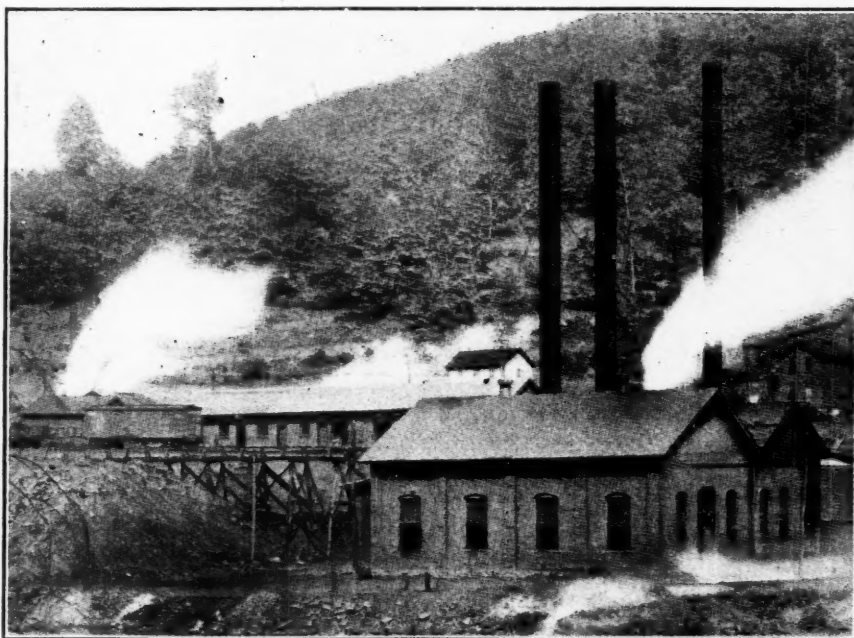
#### MOTORS VS MULES

Gathering coal with four-ton electric locomotive in 1st and 2d Left entries, and hauling same to the pit mouth by the same locomotive. Average distance coal was hauled, 3600 feet.

	Amount	Cost per Ton
Motormen, 553 hours, @ 22½c.....	\$124.43	\$0.0307
Brakemen, 692 hours, @ 20c.....	138.40	0.0342
Total labor.....	\$262.83	\$0.0649
Supplies.....	\$18.42	\$0.0045
Repairs and maintenance....	18.00	0.0045
Power.....	20.00	0.0050
Interest 6 per cent., on \$10,000.....	50.00	0.0123
Depreciation 8 years.....	35.42	0.0088
Total.....	\$404.67	\$0.1090
Tonnage handled, 4045.19 gross tons.		

Coal hauled by mules to side tracks and from there by motors to the pit mouth. Average distance of mule haul, 1200 feet.

Drivers, 250 hours @ 30c. \$75.00		
398 hours @ 18c. 71.64		
294 hours @ 19c. 55.86		
310 hours @ 20c. 62.00		
	\$264.50	\$0.0646
Stable boss.....	35.00	0.0086
Blacksmith, shoeing.....	30.00	0.0074
Feed.....	79.20	0.0193
Miscellaneous supplies.....	18.52	0.0043
Depreciation 5 years.....	25.00	0.0062
Interest at 6 per cent. on \$1500.00.....	7.50	0.0018
Total.....	\$459.72	\$0.1122
Delivery by electric locomotive to pit mouth, 2500 ft.		
Motormen, 277 hours @ \$2.25	\$62.32	
Brakemen, 346 hours @ \$2.00	69.20	
	\$131.52	\$0.0322



ELECTRIC POWER STATION AT EHRENFELD, PENN.

The above comparison is given because the conditions under which the gathering locomotive and the mules worked, were almost identical, although the grades in rooms served by the gathering locomotive were somewhat heavier (12 per cent.) than on the other side of the mine, where mules were used.

From this and other experiences, I am quite satisfied that the use of gathering locomotives when properly installed, should result in an economy of not less

sible for a 15-ton electric locomotive to bring out 100 mine cars with a capacity of two tons each, or including the weight of the locomotive itself, about 300 tons. The ordinary trip in this instance, however, is about 80 cars. There are in the region many other installations accomplishing equally good results.

#### MACHINE MINING

According to E. W. Parker, statistician of the United States Geological Survey,



there was mined by machines in the United States during the year 1910, 174,012,293 short tons of bituminous coal, an increase over the previous year of 31,515,415 short tons, or 41.7 per cent. The rapid growth of machine mining in the past ten years is decidedly gratifying to everyone interested in the industry, not only as an indication of progressiveness in the matter of lowering the average cost of production, and as a conservation measure, but also as tending toward increased safety of the men working at the face by reason of the discontinuance of shooting off the solid. Properly conducted machine mining, particularly where chain undercutting ma-

is not possible to give a flat figure that can be generally applied because the mining conditions are of such a varied character that methods found successful in one mine or bed, will be found unsuitable elsewhere, but from considerable experience, I think it safe to say that where properly handled an economy of about 10c. per gross ton below the pick mining rate is possible of attainment.

I have in my possession detailed figures of the mining cost at two operations, one where all of the coal is cut by electric chain undercutters, and the other where all of the coal is cut by air-driven punching machines. The pick-mining rate for the year when these statements were compiled was 62c. per gross ton.

Electric breast machines, output for one year 321,808 gross tons.

	Per Ton
Labor.....	\$0.4134
Material.....	0.0259
Insurance and taxes.....	0.0009
Depreciation.....	0.0091
Interest charges.....	0.0025
	0.4518

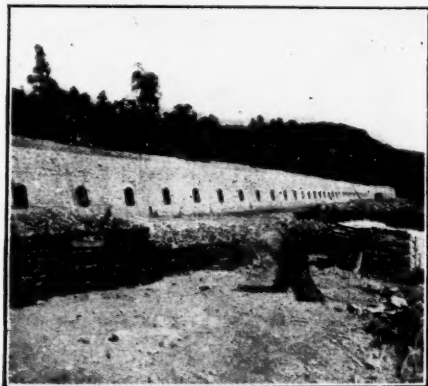
Compressed-air punching machines, output for year 99,207 gross tons.

	Per Ton
Labor.....	0.4810
Material.....	0.0211
Insurance and taxes.....	0.0095
Depreciation.....	0.0132
Interest charges.....	0.0036
	0.5284

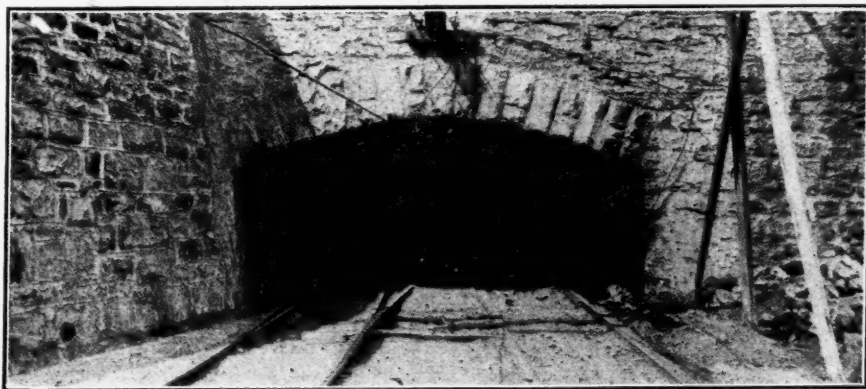
These two examples cannot be taken as a general average, because in the instance quoted where chain machines are

they do not enjoy as fully as they should, the natural advantage the region has in lying nearer to the seaboard and the New England market than any other considerable field of bituminous coal. Based on the belief that the freight rate is discriminatory against central Pennsylvania, as compared with coalfields farther west, the Operators Association has recently brought a complaint before the Interstate Commerce Commission, from which it is hoped relief in this matter will result.

It is quite well known that in addition to this region others in the bituminous fields are suffering in like manner. The prices realized under the keen competition leave little or no margin of profit. It quite frequently happens that coal operators in preparing their cost statements, do not give sufficient weight to the items of "depletion of coal reserves" and "depreciation of plant and equipment," in other words, the monthly and annual statements of any coal-mining operation should invariably carry an item for amortization of capital account. This, of course, must vary according to the conditions at each particular colliery, but it should, under no circumstances, be omitted. Otherwise, the operator is almost certain to deceive himself.



COKE OVENS, MOSS CREEK, CAMBRIA COUNTY, PENN.



MOUTH OF MAIN ENTRY AT EHRENFELD, NO. 3 MINE

chines are used, results in an increased yield of large coal and a decided decrease in the amount of coal, too often wasted by being thrown into the gob when solid shooting is permitted. According to my observation and experience, chain undercutting machines are to be preferred where the bottom is reasonably smooth and uniform, but in the B or Miller bed, in central Pennsylvania, this is not usually the case, as rolls or "horsebacks" are frequently encountered. Where this condition exists, punching machines driven either electrically or by compressed air, are preferable.

Questions are frequently asked as to what saving in mining cost may be effected by installing mining machines. It

used, the mining conditions are rather exceptionally favorable. In the other case, where punching machines are used, the conditions are about the same as the general average in that field.

#### UNPROFITABLE PRODUCTION

Notwithstanding the progressiveness and energy displayed by the operators of the central Pennsylvania field, they have for the past four years labored under insuperable difficulties, due to the great increase in producing capacity of mines in this and competing fields where the cost of production by reason of more favorable mining and geological conditions, is lower. It is contended by many of the operators in central Pennsylvania that

#### Photographing Mine Maps

Mine maps should be made on more than one scale for convenience in handling, as well as for the psychological advantage that a small map fades the incidentals and brings the broad economic features to light. The larger companies are now photographing their big maps to reduce them to a more reasonable size, and to permit the filing of their records in a book about the size of a large sheet of typewritten paper, and an inch or so thick. The scale favored is 500 ft. to the inch.

The original to be photographed should be a tracing or map with unimportant details omitted. These details in a mine map will be the coal thicknesses, station marks, levels, progress dates, etc. The camera is set at a distance from the map so proportioned to the focal length of the lens that the reduction of the map is in some even proportion. The ratio can be so satisfactorily adjusted that old and new prints can be placed together, the break barely showing on the drawings.

The Consolidation Coal Company, Fairmont, W. Va., was one of the pioneers in the introduction and use of photography in coal-mine engineering. This company keeps its records as white prints and the officials are considering the construction of a graduated track on which camera display boards can be slidden, the lighting being by two pairs of mercury vacuum lights, in two reflecting cases set one on each side of the drawing.

# Coal Handling at Power Stations

One of the first considerations in locating a power station is accessibility from railroad and water connections, so that coal can be brought to it either by land or by water or if possible by both. The economical handling of coal is an important item in the cost of generating steam, which in turn affects the earnings of a company and the dividends which it can pay the stockholders.

The number of men employed should be kept at a minimum, and mechanical means adopted wherever feasible. Yet it is possible to use so many automatic and complicated devices that their cost may even exceed that of employing a large force of men; so the engineer, in laying out an installation, should make

By Charles H. Hughes\*

*The handling of coal at power plants forms an important item in the total cost of power. The coal-handling equipments of four large New York plants are described. These are typical modern installations of recent design.*

\*82 Beaver street, New York.

HUDSON & MANHATTAN RAILROAD POWER STATION

The station of the Hudson & Manhattan Railroad, at Jersey City, N. J., supplies electric power for operating the trains in the Hudson companies' tunnels, connecting New York, Jersey City and Hoboken. It is advantageously located, being not only in the center of the distributing system, but also accessible to the railroads entering Jersey City, which makes it possible to ship coal directly from the mines to the station.

At present the station contains eight 900-h.p. Babcock & Wilcox boilers, the complete installation calling for 16. The boilers are all on the same level, and over them are the bunkers, having

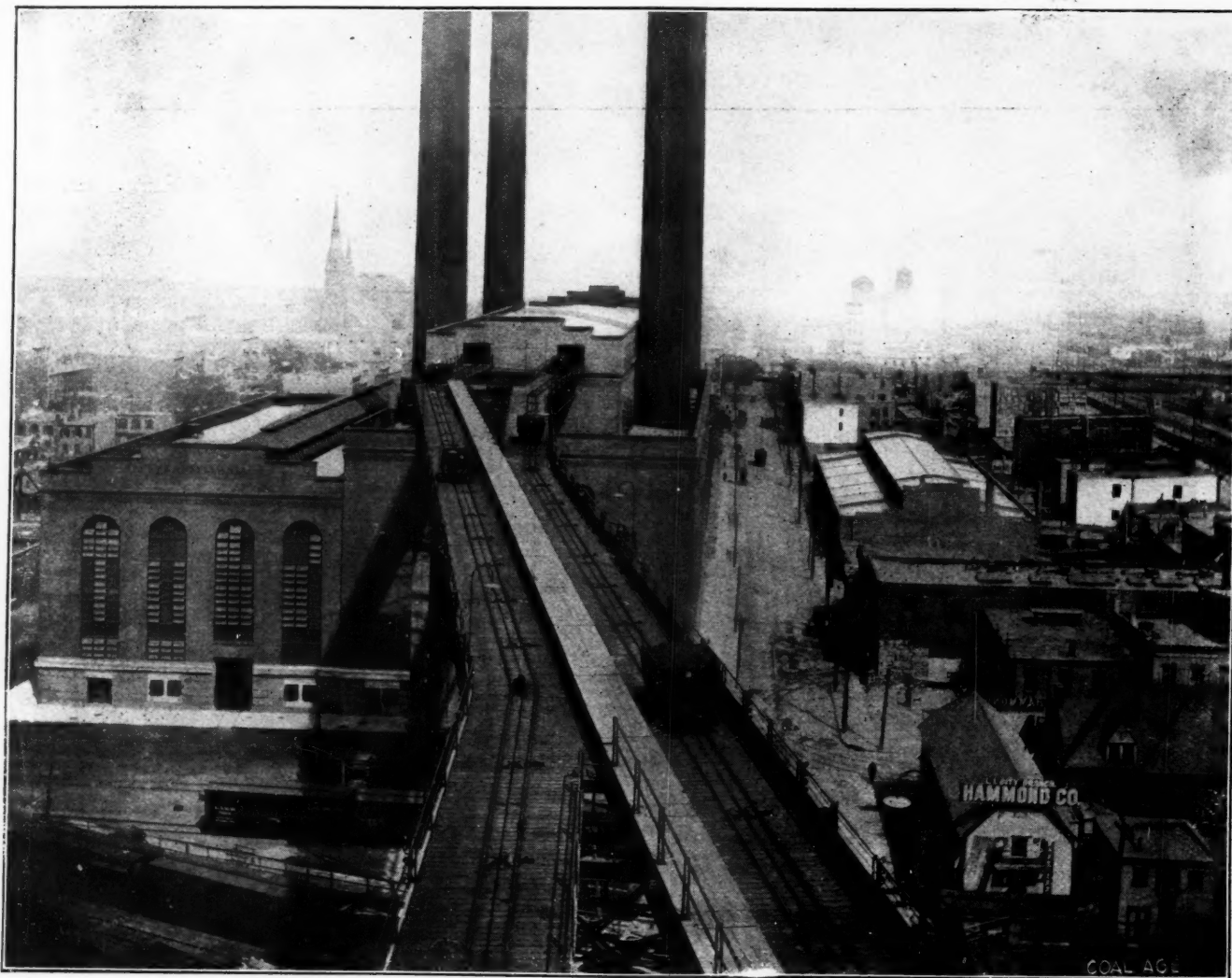


FIG. 1. CABLE SYSTEM WORKING IN COMBINATION WITH HOIST AT PENNSYLVANIA RAILROAD POWER STATION, LONG ISLAND CITY

a careful study of the various steps necessary to get the coal from the car or barge, to the bunkers, selecting either men or machines, accordingly as they appear best suited for getting the coal to its destination in the quickest and most economical manner.

The coal-handling equipments described below were designed for some of the largest and most important power stations in New York and vicinity, and all, except the one at the Bush Terminal which is under construction, are in successful operation.

a capacity of about 4000 tons. Coal is dumped from the cars into hoppers, from which it is taken by conveyers and skip hoists to the bunkers. There are two separate duplicate systems, each having a capacity of 60 tons an hour.



Referring to Fig. 2, cars are run into the low building in the foreground, and the coal emptied into the hoppers below, of which there are four, two under each

can be operated by one man standing near the weighing hopper scales which are located in the tower at the basement or street level.

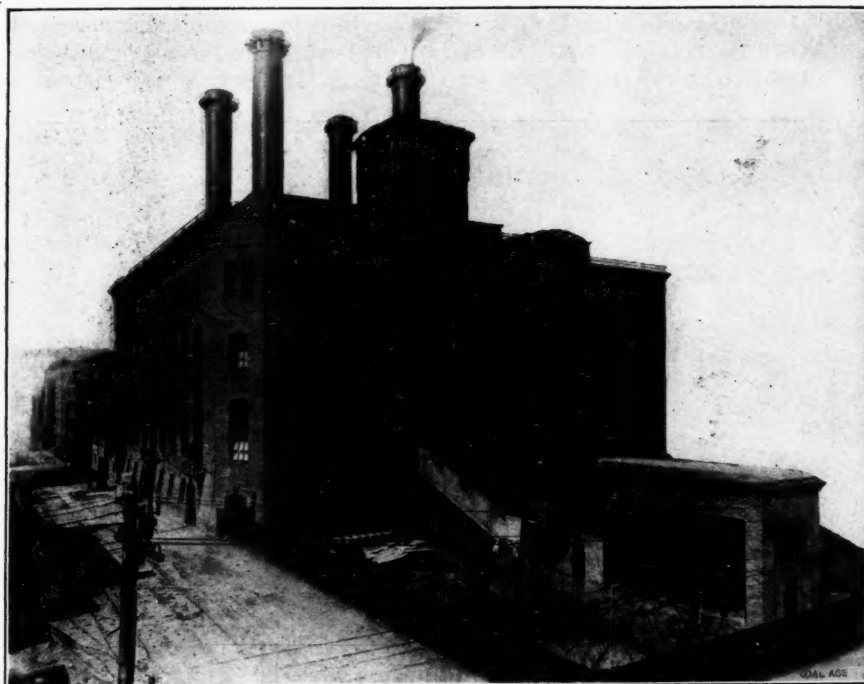


FIG. 2. POWER STATION OF HUDSON & MANHATTAN RAILROAD AT JERSEY CITY, N. J.

track. As the systems are in duplicate, two of the hoppers belong to one system and two to the other. Each hopper is provided with a pusher feeder for regulating the flow of coal onto two (one for each system) 30-in. Robins belt conveyers, which rise at an inclination of 20 deg. to the tower in the station about 100 ft. away from the cars. The belts are driven by an electric motor.

When the coal reaches the tower it falls from the belt into a hopper, at the bottom of which is a grizzly that separates the large pieces from the small, the large going through a crusher and meeting the small in another hopper. This hopper has gates communicating with either one of two weighing hoppers.

After weighing, the coal is dumped into receiving hoppers, provided with gates feeding into skips. These skips are raised 125 ft. to the top of the tower, and then discharged into the main distributing hopper. The gates in the receiving hoppers are opened and closed by the skip-hoist cars, the hoist being electrically operated.

The distributing hopper has spouts which feed into each wing of the station. The distributing conveyers of each wing are alike and consist of two 14-in. Robins belts running longitudinally over the bunker on opposite sides and a 16-in. belt which supplies one of the 14-in. conveyers just mentioned. Where necessary, automatic trippers are installed to discharge the coal into any desired part of the bunker, as shown in Fig. 3.

Either one of the systems, or both,

other purposes. The building is of reinforced concrete, the bins being elevated so that wagons can be driven beneath them.

The coal is brought in on the railroad track which runs parallel to the pocket at an elevation of about 9 ft. below the driveway, and is discharged from the cars to a scale weighing pit. From this pit it is drawn off by valves to a feeder, which fills the conveyer buckets running below it, and is so constructed that no coal is spilled during the operation. By means of the conveyer, the coal is elevated and discharged into the bins.

The conveyer consists of a number of sheet-steel buckets 30 in. wide and 35 in. on centers, suspended between steel links 17½-in. centers and carried on 20-lb. T-rails by 6-in. wheels. Each bucket can hold about 300 lb. of coal, and when running at a speed of 40 ft. per min., the conveyer has a capacity of approximately 120 tons of coal per hour.

On the vertical runs, the rails and guides are omitted, as the conveyer hangs in a plumb line. At the corners or turns are two revolving wheels, Fig. 4, mounted on the same axle, and suitably supported by brackets. These wheels engage the 6-in. rollers on the conveyer chain and are revolved by them, thus reducing the fric-



FIG. 3. BELT CONVEYER OVER BUNKERS AT PLANT OF HUDSON & MANHATTAN RAILROAD COMPANY

#### COAL POCKET FOR THE BUSH TERMINAL

The coal pocket shown in Fig. 7, located at the Bush Terminal, Brooklyn, N. Y., has a capacity of 3500 tons, the coal being used in the power station and for

tion to a minimum. The buckets always hang in a vertical position between the revolving wheels.

An interesting feature of this installation is the fact that on the vertical run

of the buckets the chain is twisted at an angle of nearly 90 degrees. Thus, the buckets shown in Fig. 4, which is a view at the bottom turnwheel, are, at the top, turned at right angles to the position shown. This is one of the important features of the Hunt conveyer which is here used.

The driving mechanism located over the pockets, Fig. 7, consists of a pawl driver, run by a belt from a 25-h.p. electric motor. Intermediate between the pawl driver and the pulley, are accurately cut gears, which are entirely incased in an oil-tight compartment and run in a bath of oil. Pawls on the driver engage studs between the links on each side of the conveyer in such a manner that a continuous and smooth motion is given to the chain. Variation in the length of the links, due to wear, does not affect the smoothness of running.

Referring to Fig. 5, which well illustrates the driver, it will be noticed that just in front of the driver a bucket is being discharged. This is accomplished by a dumper, several of which are placed along the upper run of the conveyer. The dumper consists of two cams which are mounted on a shaft and engage cams on both sides of the buckets. The conveyer, moving along the track, causes each bucket to successively engage a

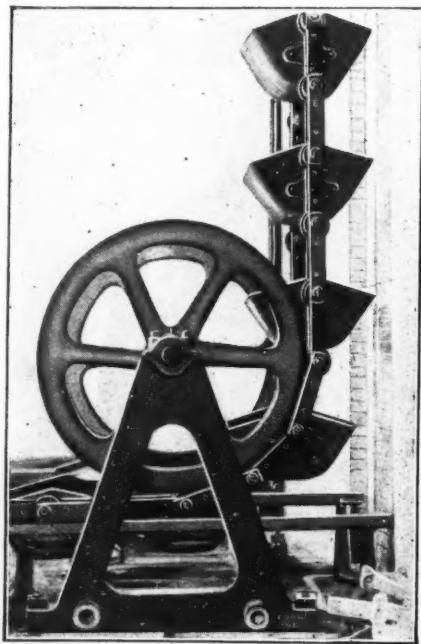


FIG. 4. HUNT BUCKET CONVEYERS, BUSH TERMINAL, BROOKLYN

dumper, thereby emptying the bucket. A dumper can be attached anywhere along the line and can be easily disengaged by throwing back the lever, which remains in this position without further attention until required again. This coal-handling machinery was built and installed by the C. W. Hunt Co., West New Brighton, N. Y.

#### LONG ISLAND CITY POWER STATION

The station located at Long Island City, on the East river, which furnishes the electric energy for the Pennsylvania tunnels, is one of the largest in the country, having an equipment of 32 Babcock & Wilcox boilers. It is of the double-decked type, the boilers being set

in the coal by barges. From these it is hoisted and run into the bunkers by means of a cable railway.

A steel tower (shown on front cover of this issue of COAL AGE) was built on the dock. In the lower closed portion, is an engine for hoisting a two-ton clam-shell bucket from the barge to the boom on the

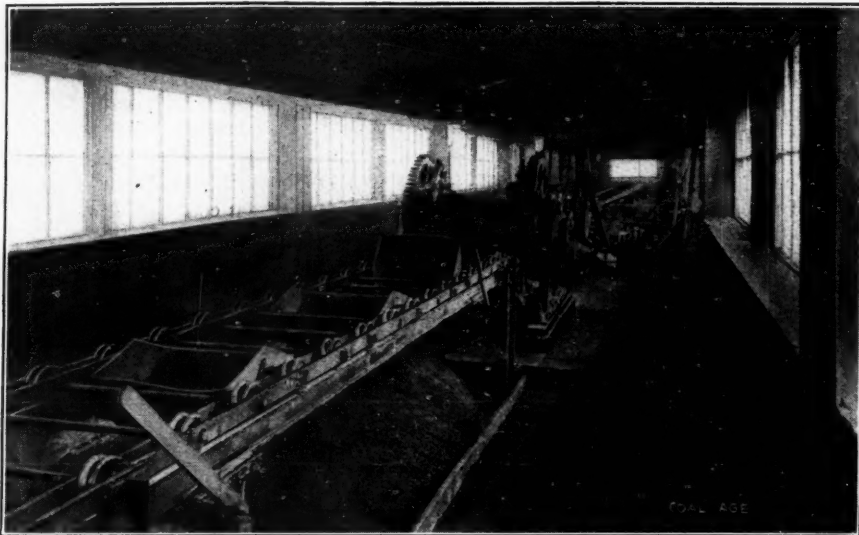


FIG. 5. SHOWING A DRIVER AND CONVEYER BUCKETS OPERATED BY AN ELECTRIC MOTOR

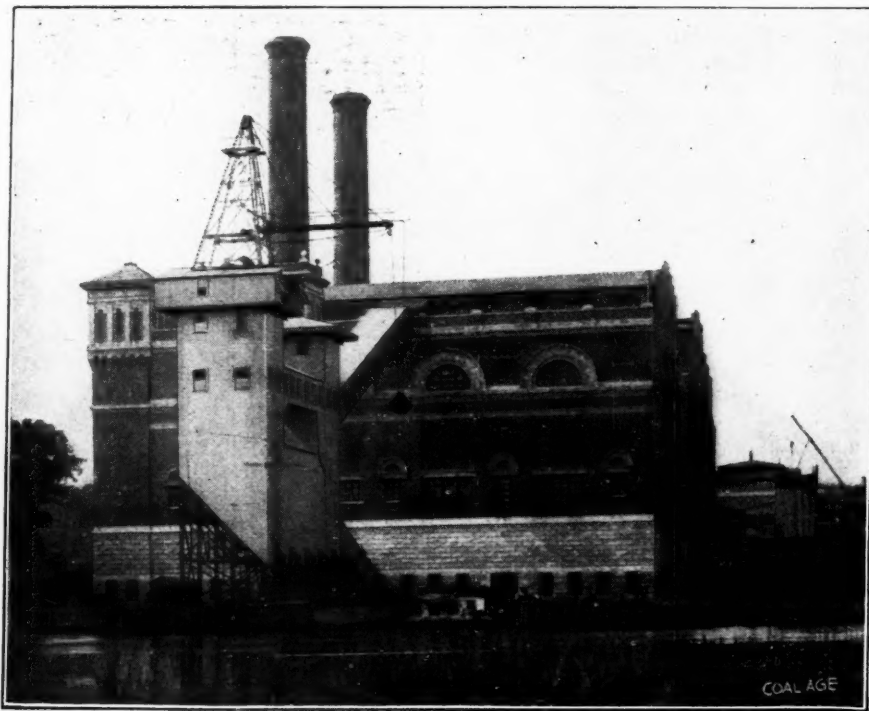


FIG. 6. COAL IS CONVEYED FROM TOWER TO POWER HOUSE ON TWO INCLINED ROBINS BELT CONVEYERS

in batteries of two, eight batteries on the first floor and eight on the second directly over those below. Over the second tier of boilers is the coal bunker.

To design a coal-handling plant for a station of this size, required careful study on the part of the engineers. Since the station was located on the East river, advantage was taken of this fact, to bring

tower, an engine for opening and closing the bucket, and another for running it, after it has been hoisted, to the discharge hopper in the tower. The top of the tower is 190 ft. above the dock, and the boom 170 ft. above the water. The machinery for hoisting and trolleying was designed and installed by the Robins Conveying Belt Company. The



bucket can make a round trip in 45 sec., that is, it can be filled, hoisted, emptied and dropped in that length of time. The tower is operated by one man.

On the upper part of the tower is another inclosure, in which is a hopper, and below it a crusher. Chutes from the crusher take the coal to a weighing machine, and then to the delivery hopper.

#### A STEEL BRIDGE IS USED

From the tower to the power station, a distance of about 500 ft., is a steel bridge over which cars are drawn by a cable, as shown in Fig. 1. The cars, after being filled at the tower, travel over the bridge, enter the top of the power house, pass down one side over the bunkers, make a half turn at the far end, pass along the other side and then out onto the bridge again, which at the tower has another half turn. A car travels about 2500 ft. in making a complete trip.

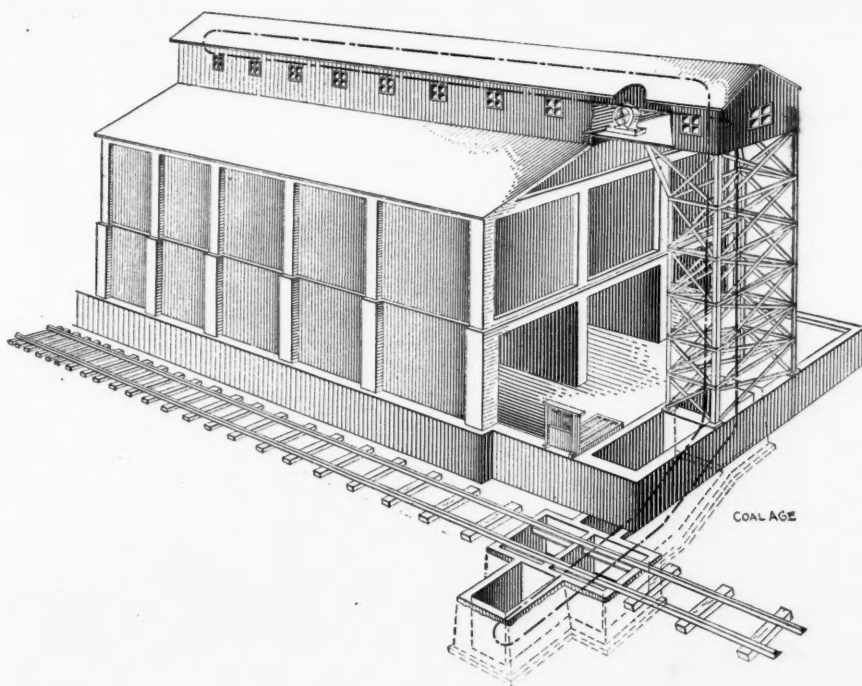


FIG. 7. REINFORCED-CONCRETE COAL POCKET AT BUSH TERMINAL, BROOKLYN

When a car is to be filled at the tower, its clutch is temporarily released from the cable and the car stopped under the feed hopper, the doors of which are opened by the operator. As soon as the car has been filled, the clutch is thrown in, and it travels along with the cable, to the bunkers. At various places over the bunkers are trippers which catch projections on the cars and open the doors on both sides, the coal dropping in two streams into the bins below. As soon as the car passes over the tripper, the doors are automatically closed and the car continues around the track to the tower on the dock. In discharging, the car is not stopped but travels on as if still loaded.

The trippers can be placed anywhere, so that any desired bin can be filled.

The cable railroad, when operating 29 cars at a speed of 180 ft. per minute, has a capacity of about 150 tons of coal an hour.

#### KINGSBRIDGE POWER STATION

Still another type of coal-handling equipment is in use at the Kingsbridge power station of the Metropolitan Street Railway Company. This station, like the one at Long Island City, has its boilers arranged in two tiers, the bunkers being over the upper tier, and is located near the water so that coal is brought to it by barges.

From a tower, Fig. 6, extends a boom, about 100 ft. above the water. This supports a bucket that is raised and lowered by a steam engine, and drawn by another engine to and from the tower. In raising the bucket a speed of 1500 ft. per min. has been obtained, but under normal conditions three trips per min. are generally

### Electric Lamps in Mines

R. A. S. Redmayne, the British chief inspector of mines, as a result of the Whitehaven explosion, became convinced of the adaptability of electric safety lamps for use under certain conditions. At his request Robert Nelson, the electrical inspector of mines, was commissioned to investigate this subject. It is believed this is a matter of general interest to coal men and a brief summary of Mr. Nelson's report is given here.

The main disadvantages of electric lamps, apart from some constructional defects, is that they will not, without a cumbersome and delicate attachment, detect the presence of explosive gas. Then there is the switching difficulty, some of the lamps having an external switch which may spark in making and breaking. Several ways of overcoming this are possible:

1. To use a lamp with a liquid battery, so designed that the light is switched on or off by simply turning the lamp over. Such a lamp may be made cylindrical in shape so that if held, or placed with one end uppermost it lights, but if held with the other end uppermost it is dark.

2. The battery may be of the ordinary dry "primary" type. It would be easy to arrange a pair of contacts, fixed inside on the bottom of the lamp, with a corresponding pair of contacts on a loose dry cell. Then, again, when the lamp is upright it will light, placed bottom uppermost it will be dark.

With either of the above lamps, Mr. Nelson explains, the possibility of igniting gas would only occur if a lamp bulb should be broken in an explosive mixture. With the battery cracking or breaking the outer glass alone is not immediately dangerous.

A further constructional defect it is desirable to remove is that most electric safety lamps give a sort of search-light effect and a rather worse general lighting effect than an ordinary oil safety lamp.

In conclusion Mr. Nelson says the disadvantage of electric safety lamps named above, as far as he is aware, can only be minimized at present, not removed. An apparatus on the same principle as the Holmes Alderson electrical firedamp detector\* (which is automatic in its action) might be utilized in each district worked by electric safety lamps. A few of the electric safety lamps in use, those in the hands of deputies, might as a means of occasionally testing for gas be fitted with firedamp detectors.

The total capacity of the anthracite storage plants of the United States is a little over 5,500,000 tons, or nearly 8 per cent. of the annual production.

\*The Holmes Alderson automatic firedamp cut out was described in *The Engineering and Mining Journal* under date of March 4, 1911.

made. The tower has a capacity of 200 tons of coal per hour.

The coal after being raised and brought into the tower is discharged into a crusher, and thence into a hopper that in turn discharges onto two Robins belt conveyers which enter the station at an incline, and are housed as shown in Fig. 6. It will be noticed that the housing is at the center of the building. One of the inclined conveyers discharges onto two conveyers extending to the right over the bunkers, and the other onto two running to the left over bunkers, the coal in each being piled up into two separate piles. By means of trippers, the coal can be discharged at any desired point.

# The Adrian Mine Explosion

By R. Dawson Hall

The Adrain mine is situated about two miles north of Punxsutawney in Jefferson county, Penn. The explosion, which occurred there on the morning of Thursday, Nov. 9, as the men were entering the mine to go to work, was of a mild order, but resulted in the death of eight men. Two of these were killed by the violence of the explosion and six others, working about  $\frac{3}{4}$  of a mile away, and located in another split, were overcome by the noxious gases contained in the afterdamp and died before they could be reached.

## DESCRIPTION OF THE MINE

The mine was opened in 1886. Adrian was one of the best equipped mines in the section at that early date. But today it lacks that outward pretense and exhibit of permanence which characterizes

*This explosion resulted in the death of eight men. Six succumbed to afterdamp and two were killed by the violence of the blast. The cause of the explosion is mysterious, but it may have resulted from a short-circuit following a roof fall.*

tration. The mine is situated 8 miles west southwest from Sykesville, where an explosion occurred on July 15 of this year, causing the death of 21 men. An

nearby, determined to make a complete examination of Adrian mines. He was especially anxious to determine the condition on the tops of falls and in abandoned sections of the mine. He noted and recorded all his observations, which covered from 50 to 60 separate places. In all he was unable to find gas. He spent four days at Adrian, Sept. 1, 5, 6 and 7, and some weeks in nearby mines. In Adrian he found no gas and reported that the ventilation was good in all sections.

The fan is a Capell, 16 ft. in diameter with blades 8 ft. wide. When the inspector made his report the fan was making 130 r.p.m. and producing a water gage of 1.8 inches.

The air at the fan measured 102,375 cu.ft. per min., and was divided into six splits as in the following table:



POWER HOUSES AND FAN AT ADRIAN MINE

modern mine developments. It is needless to add that since the time of its opening, a quarter of a century ago, there has been extended development until today the workings cover roughly some 8000 acres. The mine is operated by the Rochester & Pittsburg Coal and Iron Company.

The coal bed mined is the Lower Freeport. In this mine the average thickness of the bed is 6 ft., though there are occasional places where the coal runs as low as 3 ft. 2 in. and as thick as 7 ft. For those who are not well acquainted with central Pennsylvania, it may be added that the coal is a bituminous bed of good quality and excellent for coking. It lies near water level at Adrian and is reached by a slope of which the portal can be seen in an accompanying illus-

account of this disaster appeared in the Prospectus number of COAL AGE.

Adrian had an explosion about 15 years ago and two men belonging to an exploring party were killed. Edward W. Robinson, who was then superintendent, nearly lost his life on that occasion. Many years ago there was some trouble with gas in the 9th Left and in the 8th Right. In the latter heading, operations were suspended till the men were supplied with safety lamps. An erosive fault appeared and to its occurrence the presence of gas was, with good reason, attributed.

## THE LAST MINE INSPECTION

The recently appointed inspector, T. A. Furniss, soon after his appointment, knowing that there was gas in mines

## AIR COURSEING ADRIAN SPLITS

Split No.	Cubic Feet per Minute at Last Cross-cut	Men in Split	Cubic Feet per Man at Last Cross-cut
1	12,864	49	262
2	19,384	55	333
3	12,296	60	204
4	15,696	54	290
5	10,080	41	354
6	21,600	70	308

## THE ORIGIN OF THE EXPLOSION

For a long time after the explosion there was an expectation that its origin would be discovered. It was confidently reported that Mike Dehannis, cutter, and Paul Sinoski, his scraper, were the innocent causes of the disaster, but now that they have been found, the tendency is toward placing the source of the ex-



plosion elsewhere, perhaps at a point a quarter of a mile from where their dead bodies were discovered.

It is customary to find a cause for all explosions, that cause being often determined by the personal predilections and needs of the investigator. Here, however, if neither Sinoski nor Dehannis set fire to the gas the explosion must have been due to short-circuiting of a haulage wire or possibly to the leaving of dynamite or caps within the mine, despite the fact that the use of dynamite is forbidden except for the shooting of rock headings. The cause is in any event not obvious. There was no fire in the mine before the explosion. There was probably none immediately afterward and none has been discovered. The explosion is a mystery, not alone in that the cause is not known, but because a cause is hard even to imagine.

The mine inspectors failed to find gas after the explosion though they made

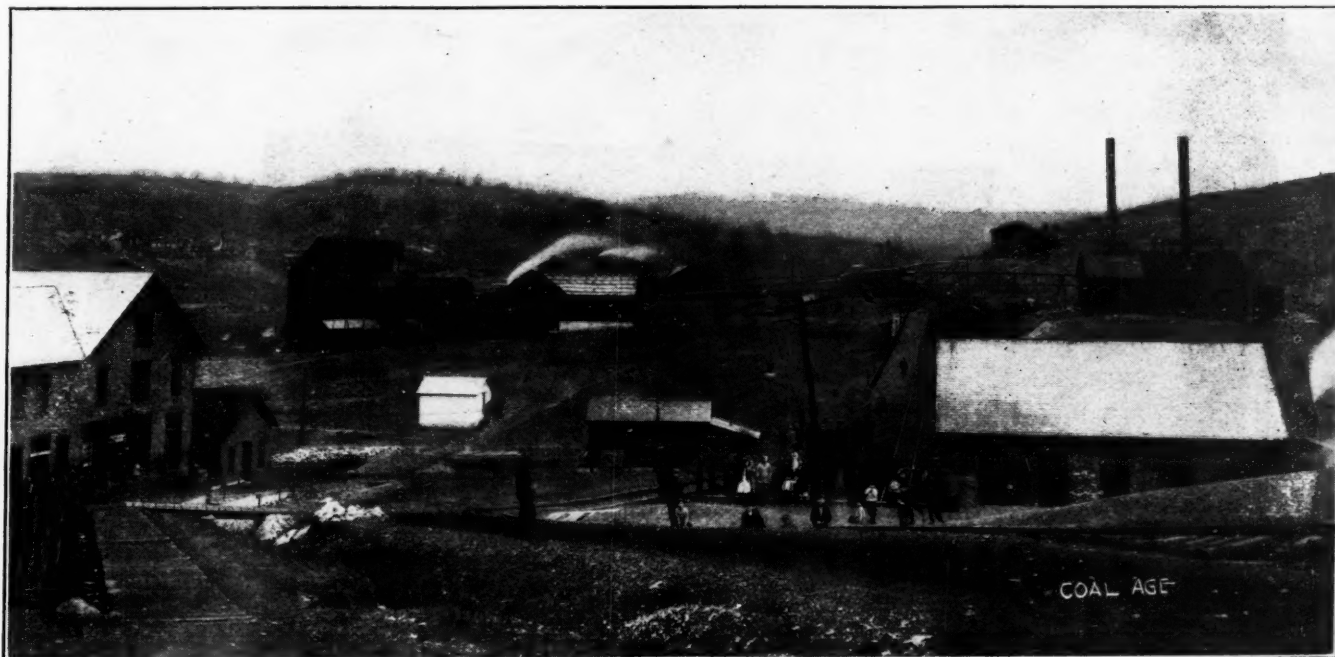
time the mines are examined by the firebosses. This rule was followed on Nov. 9, the firebosses being William Haddick and William Maloney. Among the first to enter were Dehannis and Sinoski. They were working in the 13th Left which is reached by way of the 12th Left through a cross haulway known as the 6th East.

They did not, however, follow the regular haulway to their places, but went by way of the 12th Left and 10th East. One man reached a point 50 ft. beyond the intersection of these headings. The other was found about 500 ft. further and was probably considerably in the lead. When they were at these points, the explosion must have occurred. Neither man was burned or even scorched. In fact, had they been five minutes later they would not have been killed by the force of the blast, for they were on the very edge of the territory where the severity of the explosion died out. But the gust threw one man flat on his face, where he lay

declared that no noise was heard, but states that he was thrown against the timbers with sufficient force to raise a lump on his head. It appears that pails and coats in hand, the miners hastened down the heading. They were all foreigners.

#### HOW TO ACT IN AFTERDAMP

From the survivors, who represented themselves as at first passed by others, it appears that those who ran the fastest were more speedily overcome. Those who left with moderate speed did not increase their pulse rate or enlarge the capacity of their inspirations or the number of their lung movements per minute. They therefore inhaled and absorbed less carbon monoxide and were enabled to travel further, passing seven of their companions lying prostrate along the heading. It has been said that due care not to hurry or in any way overwork in the presence of afterdamp is to be counselled, because



SHOWING HEAD OF SLOPE, STORAGE BIN FOR OVENS, AND ABANDONED POWER HOUSES

diligent search for it. Every effort will be made to ferret out the cause. The officials of the company desire to know it so as to safeguard the mines against a possible repetition of the disaster. The miners of Adrian are mostly foreigners, but many have grown up with the mine and it is a mystery to them how the explosion occurred. The men are all of a high type of citizenship; cleanly, hard-working, self-respecting, gradually absorbing the favorable surroundings of their environment.

#### DEHANNIS AND SINOSKI

It is a rule at Adrian mines that the entrance to the mine be protected by adequate locked gates till 6 a.m. These gates are guarded by a watchman. Mean-

till he was found with his face in the mud. The forward man was possibly thrown some distance and fell with his arm over his face, his skull being broken, his arm fractured and the heel of his rubber shoe cut off. Both men showed by their blackened appearance that much coaldust was being driven through the headings by the expelling current.

#### THE OTHER VICTIMS

Other men, whose work lay in the 2d East, off the old 9th Left, entered the mine about the same time as the two men mentioned. It appears that some arrived at their working places, stripped off their coats and started to work. About that time the explosion probably occurred. One man, Angelo Fornio, who escaped,

hurry stimulates the lungs and the heart, and moreover draws heavily on the vitality of the impetuous runner or overworker.

Two men had presence of mind enough to stop, dip their handkerchiefs in the tea contained in the tanks of their dinner pails and carefully wrap their mouths with the damp rags. They are living to recommend such precautions to others.

#### THE MOTORMEN

The motormen arrived later. By that time, there was an appearance of smoke near the foot of the slope. This was accompanied by the smell of burning from the explosion. Some said it was merely fog and that the smell arose from the smoldering of a short-circuited, rubber-

covered cable. The boss motorman turned off the power, believing that such a broken circuit had actually occurred. But the men were not disposed to go in, the fog becoming denser, the smell stronger and the smell not resembling in any way the odor of burning rubber. Those who did go in soon concluded that safety lay in leaving the mine.

It must be explained that the ventilation is being provided by a blowing fan and the air consequently passes around the workings, using, as has been said, six splits, and leaves the mine by the main haulway. Thus the men entering the mine passed into the return airway. This must have contained much afterdamp, although the explosion having short-circuited the air in the affected districts, the afterdamp was being but slowly removed. In fact, it may be fair to assume that the air circulated mainly where the impurities were least in percentage. The brattices, which were all constructed of wood, were blown down over an area conservatively estimated as being a half mile square. Two doors perfecting a single stopping were down and the air of the explosion area was circulating its foul products through another split. The return, where all or part of the other four splits were discharging was not dangerously befouled by the afterdamp, and was used freely by the rescuers.

#### IMPROVISED RESCUE CORPS

Anthony Goodlick and Mike Zuby and another foreigner induced Fred Hall to take them in on his motor, and together the four made a dash to save the seven men that Goodlick and Zuby had passed in leaving the 2d East. They gathered up an Italian, Fornio, and hauled him to the main slope, where he was transferred to a car and drawn up to the surface. Later he was successfully resuscitated. Three plucky men returned and started to bring out two others. Zuby and Goodlick caught hold of the prostrate forms and started to drag them to the motor. But the afterdamp, hard physical labor and increased heart action from excitement had already combined to weaken them. Leaving their friends for whom they had risked so much, they returned to the slope mouth in order to save their own lives and none too soon, for on reaching the main entry they fell down, Goodlick first and Zuby shortly afterward.

#### OFFICIAL RESCUE WORK

Robert Maloney, the mine foreman, started to lead a rescuing party as soon as the news reached the surface. But every moment the return air was getting more foul, and he could not reach the places where the men were known to be.

The rescuing parties were soon augmented by the arrival of A. W. Calloway, general superintendent, R. B. Dick who superintends Adrian mine, and T. A. Fur-

niss, the inspector of the 12th Bituminous District of Pennsylvania, of which Adrian forms a part. They built many canvas stoppings and, succeeding in driving the air up to the crosscut nearest to Room 22 in the 13th Left out of the 6th East, T. A. Furniss entered the above room. Returning, he found the others sitting silently along the side of the heading. There had been a fall somewhere, a large cave, which Mr. Furniss did not think boded them any good, and he spoke to the rest of the party about it, but no one answered, all being seemingly under a spell. Shouting to them, he roused them from their stupor, so that one and all followed his advice and example and proceeded to leave the vitiated heading as soon as possible, but thoughtfully keeping tally of each other.

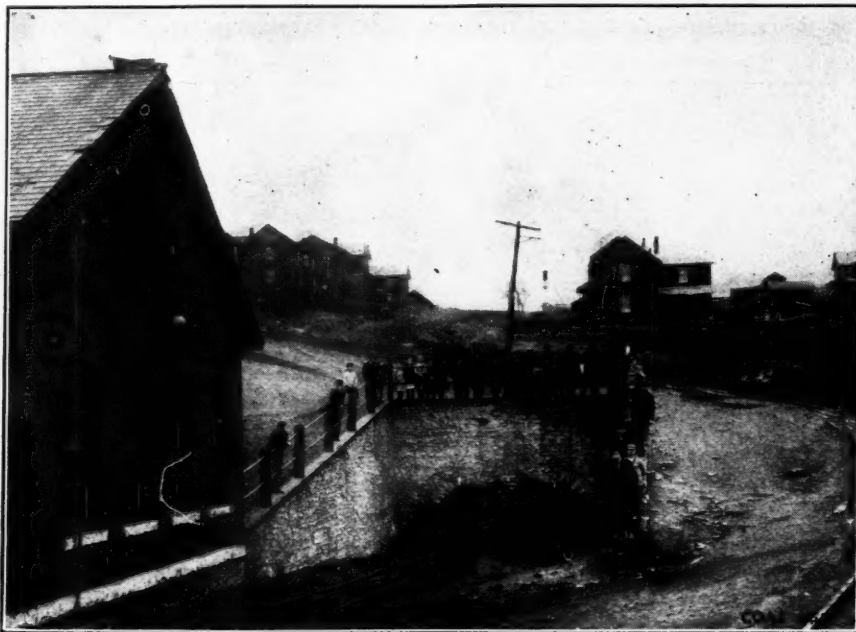
Some think the air-current was reversed, but if so it was only temporary.

Rescue Car had not been wired for; all those present having such an earnest desire to see what *they* could do, that they overlooked the equipment at their disposal. At four o'clock the car was sent for. At that hour another corps entered the mine but at five o'clock all were withdrawn exhausted, the tally being taken to see that all, totaling 59, came out.

Inspectors Furniss and Lowther with a few men entered the mine at 8 p.m., exploring the 2d East out of 9th Left. They found the bodies of six men. These bodies were hauled to the surface later with the aid of the corps from the U. S. mine rescue car. Search was resumed for Dehannis and Sinoski, but without result.

#### GOVERNMENT RESCUE CAR

The rescue car of the Bureau of Mines arrived shortly after 11 p.m. The 4:15



VIEW OF SLOPE PORTAL AT THE ADRIAN MINES

ily. Probability favors the idea that the cave dislodged the afterdamp from the faces of rooms, which the newly established current of air in the heading had by no means, so far, swept clean. Fortunately Maloney managed to reach a door which, once opened, permitted a cleansing draft to sweep directly down the heading or otherwise it is to be feared that as too often happens, a rescue party would have contributed to the death roll. The party succeeded in making its way to the intake and were attended by the physicians at the mine mouth. Firebosses Haddick and Maloney, and D. Fleming, superintendent of the Eleanor shaft and John Metro nearly succumbed to the toxic action of the gas, but the opening of the door with its clean gust of purer air gave them strength enough to get out.

On returning to the surface, Furniss discovered that the Government Mine

p.m. train on the Buffalo, Rochester & Pittsburgh Railway was held for it for half an hour, but being late it lost time all along the road and arrived two hours behind schedule. J. T. Ryan, the engineer in charge, had a crew of four men. At 11:30 they entered the mine, having four oxygen helmets and a pulmotor. They also had canary birds with them. When the canary bird with the foremost observer gave unmistakable signs of the presence of afterdamp, that section of the party retreated to better air. Four donned their helmets and explored the face of the 13th entry and the last two rooms. It was anticipated that the men would be in these rooms and their machine was found at that point, but no trace was found of their bodies. The party then returned to the limit of circulation. Under Inspector Lowther's supervision the circulation was carried up to the face and thereupon the remaining seventeen rooms were in-



spected without helmets, advance being made with canary birds as indicators.

For two nights and a day, with crews of men turning over rock falls the company endeavored to find Dehannis and Sinoski, but without success. Men do not always remain in their places and the most unlikely places were searched, with almost as much diligence as the more probable. They were supposed to be the igniters of the gas or coaldust and the center of violence concentrated around the rooms it was their duty to cut. So 13th Left was searched with closest scrutiny.

At last, questioning their agency in the explosion, inquiry was made as to their habitual way of going to work and they were soon found, uncovered and

tion of clay-stemming and permissible powders. The company readily agreed to install the first at once and the second as conditions warranted. Many men were using permissible powders at Adrian at the time of the explosion. But as has been seen, the explosion arose from other causes than blasting.

### Illinois Coal Mining Statistics

The following is a summary of the Illinois coal statistics for the fiscal year ending June 30, 1911, prepared by the Bureau of Labor Statistics.

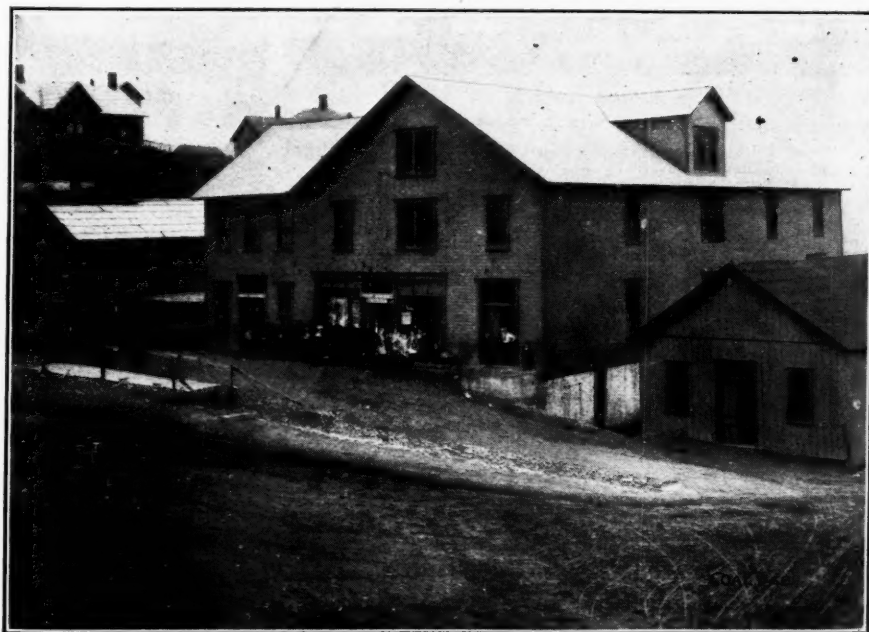
During this period the Illinois mines have produced 50,165,099 short tons, which is an increase of nearly 1,500,000 tons over that of the previous year. Of this amount 13,025,663 tons were mine-

The total number of employees at the mines doing this period was 77,410, which is an increase of nearly three thousand over that for the same period last year. Of this number 70,973 were employed underground, and 39,912 were miners.

The average price paid per ton for hand-mining was 62.7c. which is an increase of exactly 3c. above that for the same period last year. The average price per gross ton for machine mining was 49.4c., which is also an increase of nearly 3 cents.

The number of men accidentally killed at the mines was 157, of which 149 were killed inside the mine. Eliminating the large loss of life at the Cherry disaster, these figures both show appreciable increases over that for the same period of last year. The number of men so badly injured as to lose a month or more work was 709, which is a reduction over that for the same period last year.

The number of tons mined per life lost was 319,523, and the number of employees for each life lost was 493. The number of deaths per thousand employed was 2.03, and the number of men killed for each million tons produced was 3.1, which is identically the same as for last year, eliminating the victims of the Cherry disaster.



COMPANY STORE AND POST OFFICE AT DELANCEY, PENN.

easy to be observed, close by roads which had been much traveled by searching parties.

#### THE MILDNESS OF THE EXPLOSION

One fact shows conspicuously in the annals of mine disasters in Clearfield and Jefferson counties. All explosions are comparatively mild. The DuBois, Sykesville, Eleanora, Ernest and two Adrian explosions were all of light character. This explosion lifted two cars partly off the track, blew down rock and demolished wood brattices; but partly because of its unlimited chance for expansion and partly because the coaldust did not materially aid its operations it did not manifest any force at the fan, which continued its revolutions without cessation. The relief door was off, and light slats were nailed over the opening. These were not blown away.

The Rochester & Pittsburg Coal and Iron Company are extremely anxious to avoid explosions. Inspector Furniss on his appointment suggested the introduc-

run coal, and 19,588,409 tons were lump coal, the remainder being egg, nut, pea and slack.

The average value per ton of all grades at the mines was \$1.101, which is an increase of about 10c. above that for last year. The aggregate home value of the total product was \$56,034,494, which is an increase of about six million dollars above that for the previous year.

There are 845 mines and openings of all kinds; of this total, 184 were opened during the fiscal year, and 217 were abandoned. The average number of days in active operation for shipping mines was 169, which is 10 less than for the year previous.

The number of mining machines in use during this period was 1430 and the number of motors in use underground was 316. These figures both show appreciable increases over that of the year previous. The number of tons undercut by machines was 20,191,865, while the number of tons mined by hand was 29,973,234 tons.

### Nation's Coal Production

The United States Geological Survey has issued its annual coal chart, showing the production of coal by States from the year 1814 to 1910. The figures relate a wonderful history of growth. In 1814 a total of 22 tons of coal was produced in Pennsylvania. In 1815 the percentage of increase was good, but still only 50 tons were taken out. By 1825 over 100,000 tons were mined in the two States producing. In 1850 the figure had reached 7,018,181 tons. In 1876 it was 53,280,000 tons. At the end of the century it was 269,684,027 tons. In 1905 it was 392,722,635 tons. In 1907, which it was supposed would remain the record year for some time, the production was 480,363,424 tons, but in 1910 the enormous total was reached of 501,596,378 short tons, a production larger by far than that of any other country in the world. So steady has been the increase in American coal production that most of the years have been record breakers. The total production since 1814 has been approximately eight and a quarter billion tons.

The greatest difficulty in the manufacture of briquets is to secure a cheap binder. When the difference between the price of slack and first-class coal averages \$1, the cost per ton of briquetting must not exceed this amount, which means approximately 40c. for manufacture and 60c. for binder.

## Breathing Apparatus

The following table gives the conclusions of the British Royal Commission on the efficiency of breathing apparatus. English specialists are inclined to look upon breathing apparatus rather as an assistance to recovery work than as an actual life saving agency. The commission considered the Draeger apparatus heavy and uncomfortable to wear, hot and liable to catch on rough surfaces or timbering. Experience has shown the ½-hour Draeger to be more practical for use under mine conditions than the two-hour form as it weighs less, about 14 pounds as compared with 42 pounds, is cooler, does not interfere so much with the eyesight, has no chin valve to close, is quicker to adjust and there is no trouble from adjusting a helmet to the face. It is also better adapted to such work as renewing stoppings, etc.

## A Barometer for Mines

The important influence which the state of the atmosphere has upon the conditions of safety in coal mines, particularly where these mines are of a dry or gassy nature, is well known to every practical colliery man. It is the custom, in the coalfields of Great Britain, to issue colliery warnings by means of the public press, when the barometric conditions are such as to render an increase of danger probable, and every colliery manager recognizes that a careful study of the barometer is one essential of safe working.

For this reason it is of interest to refer to a barometer of increased sensibility which has been developed by the mining faculty of the University of Manchester, England, under the direction of Prof. G. H. Winstanley, whose work in mining research is so well known. This, as made by Otto Baumbach, is shown in the il-

lustration renders it eminently suitable for use in connection with mines, while for most purposes it is well adapted to the requirements of laboratories.

In installing the barometer, it is placed vertically on the wall and a stopper, which in transit is placed on the top of the capillary tube, is replaced by a dust protector. A tap, which is provided to secure the liquids during transit, is then opened and the light liquid, which for convenience in reading is colored red, is allowed to come to a standstill. The barometer is then brought very slowly to a slanting position in order to allow all the small portions of mercury

CONCLUSIONS AS TO EFFICIENCY OF BREATHING APPARATUS

Apparatus	Weight in Pounds	Oxygen Capacity in Liters and Cubic Feet		Removal of Carbonic Acid Gas	Supply of Oxygen	Air Tightness	Comfort and Convenience
		Lt.	Cu. Ft.				
Pneumatogen type III.....	14½	163	(5.8)	good	poor	good	{ Very good
Draeger.....	36-39	251	(8.9)	good	good	good	{ good
Westfalia.....	36	274	(9.7)	bad	good	good	{ bad
Fleuss.....	31	228	(8.0)	good	good	good	{ good
Weg.....	{ about 30 }	150	(5.3)	good	good	good	{ good
Aerolith.....	22			fair	good	good	{ very good

## Resistance of Iron to Rust in Concrete

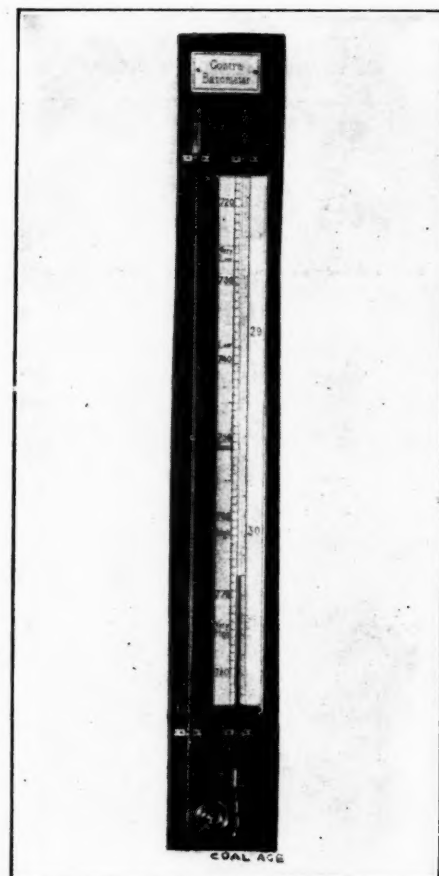
According to the *Review Scientifique*, xlix, 1, 23, an old building in Hamburg was recently demolished, from which the behavior of iron inclosed in cement could be judged. This was an old gasometer, the foundations of which rested on several pillars. The iron anchors were immersed in cement grouted to a good thickness. The 60 bars, each 2½ m. long, which formed the anchors, were examined, and were found to be perfectly well preserved. They still showed their outer bluish skin and no trace of rust. This gasometer was built between 1852 and 1855, so the iron bars had been fully 50 years in the concrete. This protection from rust can be explained by the fact that the dampening of the concrete had produced a strongly alkaline reaction, and that iron, when surrounded by alkali, is inoxidizable.

Experience has shown that it is unwise to put trust in even a good system of vaporizing to lay mine dust and prevent the extension of explosions, where extensive gobbing is practised, as wide gobs mean the accumulation of much dust which cannot be effectively dampened by any known system of wetting.

lustration. The feature of this barometer, known as the "Contra," is that the movements of the mercury siphon barometer are magnified through a light liquid. This liquid rests on the lower mercury column, which terminates in the narrow capillary tube, seen to the right of the figure, and which is provided with a suitable scale. The spiral, which is the only difference in shape from the ordinary siphon barometer, is only inserted to act as a safety trap, in order to prevent the light liquid from diffusing into the vacuum of the upper mercury chamber.

It is, of course, evident that the readings of the liquid in the narrow capillary tube are caused by the mercury in the lower siphon, and hence these readings are in reverse order to the readings of an ordinary mercury barometer. The graduation, which is from ten to twelve times as long as that of an ordinary barometer, is calibrated so that the readings in all parts of the scale coincide with those of the standard barometer. They can be observed easily at a distance. Each interval (10 to 12 mm. long) corresponds therefore with one millimeter on the mercury barometer.

The chief advantage of the "Contra" barometer is the readiness with which the smallest change in atmosphere pressure can be observed during unsettled weather. The ease with which it can be



THE CONTRA MINE BAROMETER

and red liquid to combine, after which it is brought back to the vertical position.

It is very important that while the barometer is in operation it should not be taken from its position on the wall. If, however, from any cause, the barometer has to be moved, it is brought very slowly to a slanting position until all of the mercury has filled the left-hand tube, after which the tap, which is used in transit, is closed. It is most important to bring the barometer slowly and gradually from the vertical to the horizontal position, in order to allow the mercury to fill the top of the left-hand tube. With these precautions in moving the instrument, the apparatus works in a perfectly satisfactory manner, giving greatly magnified scale readings which are a distinct asset to the mine manager.



# The Appointment of Firebosses

## Special Correspondence

There is abundant evidence that the mining people in Great Britain are taking a real and deep interest in the Coal Mines Bill. The terms of this bill, as amended by the select committee, will be discussed generally and in detail by the House of Commons ere this bill is passed on to the House of Lords for formal and final ratification—if, indeed, such stage is reached by the present Parliament.

### THE PROPOSED LAW

As an example of the interest and excitement aroused, it may be mentioned that many educational authorities have been arranging special courses of instruction on mine gases and gas testing, the growing importance of which is emphasized by the conditions imposed by clause 15 of the bill, which now reads:

(1) A person shall not, after Jan. 1, 1913, be qualified to be appointed, or to be a fireman, examiner or deputy unless he

(a) is twenty-five years of age or upward; or is the holder of a first- or second-class certificate of competency, and

(b) has had at least five years' practical experience underground in a mine, of which not less than two years shall be at the face of the workings of a mine, and

(c) has obtained a certificate from a mining school, or other institution or authority approved by the Secretary of State, as to his ability to make accurate tests, so far as practicable, with a safety lamp, for inflammable gas, and to measure the quantity of air in an air current, and that his hearing is such as to enable him to carry out his duties efficiently, and

(d) has within the preceding five years obtained from such approved school, institution or authority as aforesaid, or from a duly qualified medical practitioner, a certificate in the prescribed form to the effect that his eyesight and hearing are such as to enable him to carry out his duties efficiently, the expense of obtaining which shall, in the case of a person employed at the time as fireman, examiner or deputy, be borne by the owner of the mine;

Provided that:

(i) the requirements of paragraphs (a) and (b) shall not apply to any person employed as a fireman, examiner or deputy at the date of the passing of this act; and

(ii) a person shall not be required to obtain a certificate as to ability to make tests for inflammable gas, or as to eyesight, if he is employed in a mine in which inflammable gas is unknown.

(2) The certificate as to eyesight and hearing of a fireman, examiner or deputy employed in a mine shall, while he is so

*Great Britain is contemplating the passage of stringent laws regulating the appointing of firebosses. Particular attention is to be given the physical qualifications of the applicant, especially as regards eyesight and hearing. The matter is being actively debated, not only by the labor organizations, but the owners' and managers' associations as well.*

employed, be deposited with the manager, who shall, whenever required to do so by the inspector, produce the certificate for his inspection.

### AS VIEWED BY THE MINERS

As compared with the requirements of the existing act of 1887, the qualifications required by this new clause are looked upon as revolutionary. Many of the present-day firemen anticipate that their positions as officials will be lost under the "eyesight" and "hearing" tests, which they accordingly condemn. This will mean the appointment of new men to fill the vacancies, necessitating so far as they are concerned, a course of instruction in mine gases, etc. This is the cause of the extensive preparations now being made, and in certain quarters it is being whispered that even if the new coal-mine bill fails to pass the House of Commons, the Home Secretary may put through an order covering the points contained in clause 15, and thus insure the raising of the qualifications of the firemen. If it should happen that such a procedure is followed, the order made will be as binding as though it were embodied in the principal act, as is exemplified by the explosives in the coal-mines order.

It is not surprising, therefore, that the matter is attracting considerable attention, not only among the educational authorities, but the Association of Colliery Firemen, who are also actively discussing it. In various parts of the country there are colliery firemen's associations in existence, which are combined in one national federation some twelve thousand strong, having as one of their main objects the raising of the standard of education among colliery firemen. The Lancashire Asso-

ciation, in September, engaged instructors to give the needful tuition at three different centers in the county, and therefore, the members should have no difficulty in retaining their posts should clause 15 become a law.

### A MINE INSPECTOR'S VIEWS

In Yorkshire, classes for colliery firemen have been held for some time, and J. Mellors, H. M. Inspector of Mines, attended a gathering at Wakefield when the certificates were presented. He found that all the men had risen from the ranks, and he told them he felt proud to be able to hand certificates to men like that, because, with the certificates they would be better miners and citizens. It was matter for regret to find, in the course of his calling as a mine inspector, that every man was not able to detect gas in the safety lamp. Miners, when aware of the presence of gas in the mine, should have a wholesome appreciation of their danger and go out, or to a place of safety. Further, he hoped they would go on and fix a high standard, as there were men who had risen from the ranks to the position of general manager, and that ought to be encouragement to them.

Mr. Mellors told how he had been obliged to walk a distance of 10 miles to attend a technical class. Now there are classes for miners everywhere, education being literally thrown at them, and there is no reason why any man with energy, should not rise to be a colliery manager if he will put his shoulder to the wheel and take advantage of the educational facilities now offered.

### THE ROYAL ROAD TO SUCCESS

"Therefore," Mr. Mellors said, "persevere, and let your guiding star be safety of life and limb." He remarked that they are practical men, and should qualify to be scientific as well. One of the brightest stars they had, not only a Bachelor, but a Master of Science, was, only a few years ago, working at the coal face. It was a proud thing to be able to rise from the ranks. There was no difficulty about it other than self-denial. It could not be done, however, if they had three or four things all proceeding at once; to succeed they must have but one object in view. The one royal road to success was downright hard work. If miners all worked with that object in view, there would be fewer of the lamentable accidents which they read about to-day. If men would only qualify themselves to distinguish the safe places from the unsafe, they would be able to look after themselves without having to trust to deputies.

<sup>1</sup>In various centers this underground official is designated fireman, examiner or deputy.

## VIEWS OF THE MANAGERS

When the members of the South Staffordshire branch of the Colliery Managers' Association met on Sept. 25, President J. W. Liddell referred sympathetically to the objects sought to be attained under the new coal-mines bill. A distinct change has taken place since the time of Lord Shaftesbury's agitation on behalf of the miners, and since the time when Mr. Tremmenheere was appointed by the home office to inquire into the conditions of mining life. Female and child labor have been abolished and restrictions upon mine working have been enacted by the legislature.

Nevertheless it is alarming to know that the death rate has gone up in recent years. The authorities are anxious to arrest the upward tendency, and with that idea they all concur. The new bill is an attempt to create conditions in regard to mining work, which will tend to enhance the safety of the miners. It seeks to place the miner in a position which will make his dangerous calling less hazardous. A law of this kind is a benefit upon the whole community, and Mr. Liddell sincerely believed the bill in its final form would, in a far greater measure than its predecessors, fulfil its grand objective.

W. G. Phillips, in discussion, acknowledged the fact that modern practice in mining, especially the large increase in the areas worked, sometimes covering as much as 10,000 acres, renders new legislation necessary, the introduction of electricity alone making such a change almost imperative. Clearly, wherever the gaseous condition of the air renders safety lamps necessary, there should be no exposure to electricity. Mr. Phillips believing that no motor has been invented which can be so used with safety.

The general committee of the Colliery Managers' Association, according to the message of D. E. Parry to the members, are cordially approving everything which they believe will promote safety, and they propose communicating with the home secretary to secure redress in any matter which they consider will operate unfairly on managers as a class. In particular they propose to take steps to insure that a manager whose certificate is suspended for any reason should have the right to appeal, and they have also considered whether he should not have the right to continue to act as manager while that appeal is pending.

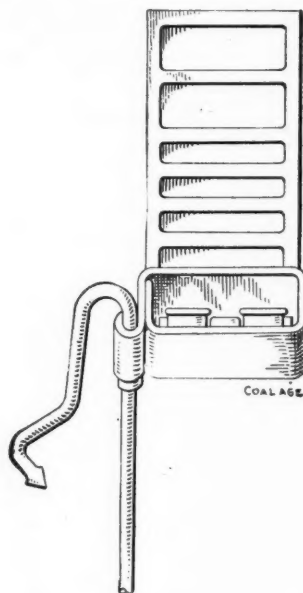
The divisional inspector of mines, Hugh Johnstone, although unable to discuss there any of the details of the Mines Bill, heartily congratulated the managers on the action they are taking. In an earlier bill, while the coal owners and workmen were strongly represented, when the bill was before the House of Commons, there was no such representative of the managers, because it was supposed their

interests and those of the colliery owners were identical. Mr. Johnstone felt then that a great deal of responsibility was thrown upon the colliery manager, which would not have been placed upon him if he had been as ably represented in Parliament as the other interests.

## A Simple Firedamp Detector

SPECIAL CORRESPONDENCE.

A very ingenious and novel firedamp detector which has been provisionally protected in Great Britain, is the invention of J. G. Guy, the resident manager of Wardley colliery in the county of Durham, and we are able to show its construction in the accompanying figure. The device consists of a sleeve with a combined divided screen, made from one piece of material, attached to the wick pricker of the safety lamp. The sleeve embraces the wick tube, and when moved upward the flame of the safety lamp is



SHOWING DEVICE THAT MEASURES THE PERCENTAGE OF GAS

reduced to a mere speck without the slightest risk of losing the light, which usually happened by the ordinary method of drawing down the wick; the normal flame being quickly regained by drawing down the sleeve.

The divided screen well behind the flame, enables the "blue gas cap" to be easily measured, and the percentage of the gas present can therefore be estimated with facility. Reference to the illustration will give a clear idea of the invention without further description.

This ingenious contrivance has been seen and used by many of the leading mining engineers in Great Britain who speak highly of its simplicity, utility, and adaptability, and has been used by the inventor and his officials with the most

satisfactory results. It is easily applied to any flat wick burner and is quite inexpensive. This simple and effective method of detecting firedamp must, in all cases where it is introduced, greatly increase the safety of working and tend to prevent disastrous explosions in coal mines.

## Results of Experiments in France

Taffanel, the French expert, urges that the practice, frequently recommended, of watering in front of shot holes in dusty mine galleries, may be classed among the measures for preventing the initial ignition of the dust. Experiments have shown that the risks accruing from blownout shots are considerably lessened by this precaution.

As a general conclusion, Mr. Taffanel says: "Other conditions being equal, dry coal dust will be more dangerous in proportion as it is finer in grain. In galleries or working places where the dimensions of the finest particles are 1 to 2 mm., no coal-dust explosion can be produced by the more ordinary initiating causes, though an explosion can be propagated there as the result of a violent initial explosion occurring in a more favorable environment as regards dust, or started by firedamp or by the detonation of a store of explosives."

"Then again: Other conditions being equal, coal dust rich in volatile matters is more dangerous than if the content of the latter be small. No explosion can be produced by the ordinary initial causes in a dust deposit where the content of volatile matters does not exceed 18 per cent., though it may be propagated there as the result of a violent initial explosion occurring over a portion of dust deposit richer in volatile matters, or started by firedamp or by the detonation of a store of explosives. Coal-dust explosions developing, as the sequel of a powerful initial explosion, in a dust deposit unfavorable to propagation, are naturally less violent and more easy to arrest than those propagated in a favorable deposit."

## Coal Production in Ohio

Ohio has produced more coal than any other State except Pennsylvania, Illinois and West Virginia. Since coal mining began in Ohio, in 1838, according to the United States Geological Survey, the State has produced 581,189,306 short tons, the figures showing an almost steady increase. In 1850 the production was 640,000 tons; in 1870 it was 2,527,285 tons; in 1890 it was 11,494,506 tons; in 1900 it was 18,988,150 tons; in 1905 it was 25,552,950 tons, and in 1910 it was 34,209,668 short tons.



Issued Weekly by the  
**Hill Publishing Company**

JOHN A. HILL, Pres. and Treas. ROBT McKEAN, Sec'y.

505 Pearl St., New York.  
6 Boulevard St., London, E. C.  
Unter den Linden 71, Berlin.

Correspondence suitable for the columns of COAL AGE solicited and paid for. Name and address of correspondents must be given—not necessarily for publication.

Subscription price \$3 per year in advance for 52 numbers to any post office in the United States or possessions, and Mexico. \$4 to Canada. \$5 to any other foreign country.

Subscribers in Great Britain, Europe and the British Colonies in the Eastern Hemisphere may send their subscriptions to the London office. Price 21 shillings.

Notice to discontinue should be written to the New York office in every instance.

Advertising copy should reach New York office by Thursday of week prior to date of issue.

Entered as second-class matter, October 14, 1911, at the post office at New York, New York, under the act of March 3, 1879.

Cable Address, "Coage," N. Y.

**CIRCULATION STATEMENT**

Of this issue of COAL AGE, we will print 6000 copies. No copies will be sent free regularly. There will be no back numbers. The figures shown here each week represent live, net circulation.

*This journal is interested solely in matters relating to the fuel industries, and is designed to be a medium for the free interchange of ideas, the detailed description of coal-mining practice, and the expression of independent thought calculated to benefit both operator and miner.*

**Contents**

	PAGE
Foreword .....	169
Anthracite and Bituminous Mining. <i>Eli T. Conner</i> .....	170
Photographing Mine Maps.....	173
Coal Handling at Power Stations. <i>Charles H. Hughes</i> .....	174
Electric Lamps in Mines.....	177
The Adrian Mine Explosion. <i>R. Dawson Hall</i> .....	178
Illinois Coal Mining Statistics.....	181
Nation's Coal Production.....	181
Breathing Apparatus .....	182
A Barometer for Mines.....	182
The Appointment of Firebosses.....	183
A Simple Firedamp Detector.....	184
Results of Experiments in France.....	184
Coal Production in Ohio.....	184
Editorials:	
Testing the Firebosses.....	185
Safety in Mines.....	185
Corrosion by Mine Water.....	186
Government Appropriations .....	186
Colliery Notes .....	187
Inquiries of General Interest.....	188
Discussion by Readers:	
Handling Mine Cars in Pitching Seams .....	189
From the Ranks.....	190
Sand House for Mine Motors.....	190
Device for Closing Air Doors.....	190
Examination Questions and Answers.....	191
Sociological Department:	
Liquor Problem in Mining Communities .....	192
A New First Aid Packet.....	193
Coal and Coke News.....	194
Coal Trade Reviews.....	197

# COAL AGE

## Testing the Fireboss

Attention is invited to the article on "The Appointment of Firebosses" appearing in this issue. Among the qualifications required are clearness of vision and good hearing.

As an instance of the vital importance of this subject, the disaster at the Globe colliery in England may be cited. This appears to have been directly due to the inability of a fireboss to detect 3 or 3½ per cent. of gas; at a subsequent test made by a government inspector, it was found that 31 out of 41 firebosses were incapable of detecting a like percentage.

The fireboss may be compared with the locomotive engineer, being directly responsible for such a large number of lives. As is well known, the engineers on our larger railroads are required to pass rigid eyesight tests, to insure their ability to distinguish the colors of lamps and brightly painted boards. On the other hand, the fireboss, often working under the most adverse conditions, and required to distinguish minute fluctuations of a hardly perceptible flame, is seldom subjected to any such test.

To the compilers of our State mine laws, is recommended the method of testing adopted by the government in British Columbia, whereby the exact percentage of gas the applicant is capable of detecting is accurately determined.

## Safety in Mines

So much has been written on the subject of safety in mining that were it not for the grave importance of the question and the frequent misapplication of the term to some improved form of appliance or device, an apology would be due our readers. In some of its uses the word safety has become a misnomer, and has a tendency to deceive the unwary and confiding worker who must use the device.

Safety in coal mining means immunity from danger, accident, hurt or loss of any kind. A safety appliance is any device the proper use of which will lessen the

danger of accident to man or machinery. Such are the safety lamps, safety gates, safety catches, safety blocks and a thousand other so called safeties.

To the general mind the word as here applied has a far greater significance than its use in this connection warrants. A safety lamp is only safe, in the presence of gas, when it is in perfect condition and properly handled by a competent person and not subjected to conditions beyond its power of resistance. Under other conditions than these a safety lamp is not only *unsafe* but positively dangerous.

Likewise, safety gates that are too frail or insecure in their attachments, or safety catches on cages that would fail to operate in time of need are a menace to safety, because they inspire a false feeling of security. A full knowledge of a present danger is the surest safeguard, because such knowledge suggests at once the remedy or at least admonishes caution. Automatic devices that tend to diminish the vigilance, the care or the caution of the person or persons in charge of life and property, invite danger and increase the risks of operation instead of diminishing them.

Many mine managers and superintendents have rejected and refused to install overwinding devices at the mines in their charge, because of their firm conviction that such a device installed at a hoisting shaft tends to make, and in most cases does make, the hoisting engineer less watchful, cautious and on his guard. The apparatus appears to work so perfectly that the engineer comes at length to rely wholly upon its operation, and himself becomes an automaton; till suddenly some sad day the spell is broken by the failure of a single part of the mechanism, and the inevitable happens. It is all done in a twinkling, but the results of that moment's unguardedness on the part of that engineer are fatal to the lifetime happiness and comfort of the widows and fatherless, made such by the accident.

Some years ago, a mine-signaling system was suggested by an engineer of standing, by which it was hoped to be able to indicate in the mine office on the surface, the gaseous condition of the mine workings whenever such condition became dangerous. The impracticability of the scheme was discussed by mining men everywhere and the effort to install the system in mines was defeated and finally abandoned. Recently, another attempt has been made to patent a somewhat similar system for the detection of dangerous quantities of explosive gas in the mine chambers, and giving the alarm at the surface. Such systems have for their ultimate tendency the elimination, in whole or in part, of the work of the fireboss or mine examiner.

All like attempts to eliminate the human factor by replacing human consciousness with an automatic mechanical device, however ingenious, jeopardize the safety of the mine just to the degree that official care and watchfulness are decreased. There is no question but that there are many helpful and desirable automatic devices adopted and in use at many mines. Our remarks refer only to such devices as are designed to transfer the responsibility for the safe operation of mines from the certified officials to the uncertain operation of a machine, which might result in finding no one responsible for loss of lives when, in truth, the responsibility should rest on the mismanagement shown in the adoption of such device.

The adoption of different forms of automatic mine doors, in order to cut out the expense of trappers, has resulted in the accidental death of many drivers and the loss of many valuable mules. The failure of the device to work, in such a case, leaves but a meager chance for the escape of either the driver or the mule, especially if the door is located on a slight grade or at the foot of a grade, which should never be done.

Our desire in this brief article is to draw the attention of mine managers and superintendents to the importance of so regulating every operation, in and about the mine, as to fix, beyond doubt or question, the responsibility for accidents that may be foreseen as possible and liable to occur through lack of faithful and thorough inspection. The duties of

each official should be clearly defined and his instructions so given that the responsibility for any ordinary accident cannot be shifted.

We would further impress upon miners the fact that any so called *safety* appliance to be *safe* must be properly used. The term *safety* does not mean exempt from danger. The fact that a safety appliance is necessary at all should warn all persons of the danger to be avoided, and should urge upon every mine employee the need of caution.

---

### Corrosion by Mine Water

Acid mine waters eat freely into bodies of concrete exposed to them, especially if the concrete is mixed stiff. When mixed with an excess of water, the necessary reactions in the cement appear to take place, resulting in a concrete which has more power to resist sulphuric acid. This acid combines with the earthy elements, such as calcium, setting the silicic acid free. The severity of action on stiff mixed concrete seems to be diminished with time. The portal of the Hoffman tunnel near Frostburg, Md., through which much mine water passes, was eaten into below the water line, nearly two inches in the first two years. After that time no further ill resulted. And in the Georges Creek field, it has been found that concrete mixed with excess of water, always shows considerable resistance to corrosion.

In the anthracite field, marked instances are to be found of the corrosion of concrete, which was mixed so wet that the water rose to the tamped surface. It must be remembered that the waters of the anthracite field are often unneutralized by the action of natural limestones, and though harmless in appearance, are nevertheless incredibly active. A concrete breaker, erected in 1905, shows much corrosion, as does also a concrete tank in which sulphur water is stored.

The most harmful effect is to be found in the uncovering of reinforcement. The tension face of a beam should always be carefully protected, where corrosive action is feared. It has been shown in a large number of experiments that no reliance can be placed in the tensile strength of the concrete alone and that as soon as

strained to its point of endurance it cracks, in fine hair-like crevices, invisible to the eye, except where aided by the presence of water, in which case the cracks are clearly lined out. When a beam is loaded therefore, so that the tensile deformation exceeds that which the concrete can endure, cracking must take place, even though the reinforcement may carry loads many times as great as those imposed. Thus a safe beam may be so creviced that corrosive waters have a good chance to work on the strengthening rods and that chance is enhanced when the covering they receive is but slight. This leads to the suggestion that the iron in ferro-concrete should be placed further within the whole mass, additional concrete being used to secure this result, wherever corrosive waters are to be encountered, as, for instance, in the washing department of a breaker.

It might be argued that concrete being porous, corrosive waters will penetrate whether the integrity of the concrete is or is not destroyed by strain. But it is more than probable that the virulence of the waters is neutralized by the outer layers of concrete and that glassy impervious silica is deposited on the outside, preventing further decomposition. The whole question of corrosion due to the action of mine water is one that the U. S. Bureau of Mines might well subject to experiment.

---

### Government Appropriations

During the last 20 years, the Government has appropriated amounts varying from 20 to 40 million dollars per annum for the Department of Agriculture. While we do not begrudge this department its generous appropriation, and appreciate that it has been the means of accomplishing enormous results, we do feel the amount, as compared with that allotted the mining industry, is entirely out of proportion.

The appropriations to the Department of Agriculture are for commercial purposes, while an appropriation to the Bureau of Mines means increased efficiency not only in the conservation of natural (and exhaustible) resources, but to *human life*. We do not believe that commercial problems are due a greater consideration than is given to the protection of our workmen.



# COLLIERY NOTES and COMMENTS

*Practical Hints Gathered Here and There, and Condensed to Suit the Busy Reader*

Slabbing or "taking up a skip" should be strictly forbidden as it often results in a loss of coal as high as 50 per cent., besides calling for an excessive use of timber. It also results in dirty coal and is dangerous and expensive.

Tests have shown that some weathered lignites make excellent briquets. The future may see lignite slack take its place beside bituminous slack and anthracite screenings as a material for the manufacture of briquets on a commercial scale.

In tests made at the mining-experiment station at Pittsburg, bituminous-coal dust through a 200-mesh sieve floated on a strong current of air, and caused an explosion when there was only 0.032 oz. of it per cubic foot of air, or one pound per 500 cu.ft. of air.

When robbing pillars see that each fall is of sufficient size, the cars removed and the timbers drawn before the strata loosen, as this lightens the weight on the next pillar. This method prevents excessive weight on pillars, increases the safety of the workmen and tends to give a high percentage of recovery.

The successful robbing of pillars depends to a large extent upon the mine boss. He should make a careful daily inspection of all pillars and should be present himself or send an assistant when falls are made, so as to be able to decide upon the amount of coal that can be taken out without danger from the overlying strata.

The yield per foot acre of anthracite coal was recently determined by Judge Newcomb, of Lackawanna county, Pennsylvania, in a case of the Delaware, Lackawanna & Western Railroad Company versus the County Commissioners. The subject was in dispute for some time, but it was finally decided that the yield per foot acre is 1225 tons.

Ventilation has much to do with determining the life of mine timbers. Poorly ventilated, moist, air passages and gangways are always productive of decaying timbering. In such cases preservation treatment gives good results, though it in no way benefits timber subjected to wear, such as drum lagging, wooden rollers, etc.

When a new hoisting rope is purchased the maker should be required to furnish a certificate of test, both of the wire used and a sample length of the finished rope. The tests should be of as comprehensive character as possible, embracing tensile, torsional bending and fatigue tests. All the details should be freely set forth in the certificate.

Uniform mining laws, as far as local conditions permit, throughout the coal-mining States of the union, would do much to add to the safety of the occupation. The miners are constantly moving from one camp to another, and from State to State, and the wrong methods of one State are easily and quickly introduced into another State. Uniform laws would do much to overcome this spread of unsafe practices.

When crushing coal for briquetting purposes be careful not to get it too fine or additional binder will be necessary. It will also be harder to fire although making a better appearance in the market because it will have a smoother surface and will not weather easily. See that the coal is not crushed to a uniform size or much more binder will have to be used. About 56 per cent. of the material used should consist of grains  $\frac{1}{4}$  in. in diameter.

When possible all mine employees should be instructed as to the danger, prevention, cause and the most effective method of fighting mine fires. Mine managers should see that all possible means are adopted to control the strong drafts often found in shafts, entries and haulage roads as they are a source of great danger in case of fire. Foremen should be drilled in withdrawing the men from the mines, and the individual miner should receive instruction on the subject.

The disadvantages of dump storage for anthracite coal are; excessive breakage; the impracticability of rescreening, and high cost of operation, which amounts to 20 to 25c. per ton. Such storage should be considered as suitable for steam sizes only. Trestle storage should never be used if it possibly can be avoided, as it gives a high percentage of breakage, is costly to maintain, has a relatively small capacity, and rescreening is difficult. It should never be found outside of yards doing a small retail business.

A good storage plant should be capable of screening all coal before ship-

ment, preparing all screenings for sale or briquetting, handling frozen coal by means of hot water and have an ample drainage system; storing all sizes in bins or spaces by themselves; and rapidly handling any and all the sizes. Such plants should also be so located that enlargement can be made as necessity demands. The first cost per ton of capacity should be low. The trackage through the plant should be more than sufficient to handle the expected tonnage and minimum breakage in stocking and reloading should be the motto of all such plants.

A single-stroke style of signal bell is preferable to the trembler style as it is more easily heard. Distinctness is the first and greatest requirement of a signal system. Much of the efficiency of a signal depends upon the quality of the equipment and the perfection of installation. All wires should be incased in wooden casings if the mine is dry or in iron piping in the case of wet mines. In deep shafts a junction box should be located near the middle of the shaft to facilitate the localizing of defects in the wire and help in its support. Wire used in a shaft should be insulated with lead covering and incased in smooth piping to protect it from injury. Only dust, gas and damp proof bells should be used in gaseous mines, for an ordinary bell is exceedingly dangerous in a gaseous atmosphere.

The burning qualities of briquets, the flame produced, the smoke given off and the completeness of combustion depend largely upon the shape of the briquet and the nature of the binder used. Briquets should be of such shape as to insure a good circulation of air. The binder should not contain too high a percentage of constituents having a low boiling point or it will distil away before the briquet is heated to ignition and give off the smoke and odor which should be absent from the burning of the perfect briquet. Inorganic binders and also starch, molasses and sulphite liquor are smokeless. Tar pitch and petroleum residues, if not carefully regulated, will produce smoke and odor, but if the shape of the briquet is such as to allow a good circulation of air through the bed of fuel, thus enabling a more nearly complete combustion to take place, the smoke given off will be less than that produced by the coal from which the screenings were derived.

# INQUIRIES of GENERAL INTEREST

*A Page Devoted to Those who want Information. All Questions must be Accompanied by the Name and Address of Inquirer*

## Effect of Regulators in Splitting

A total of 8000 cu.ft. of air is passing through three airways A, B and C, with a water gage of 1.7 in. All areas are the same; but the lengths of the airways are: A, 6000 ft.; B, 10,000 ft., and C, 21,000 ft. It is desired to increase the quantities in B and C so as to make each of the three airways pass an equal quantity of air. (a) What effect will it have on the water gage? (b) In what proportion will the resistance be increased in A and B when the change is made? (c) If B and C each get as much air as A gets now, what will be the total increased circulation?

Puritan, Penn. H. M. M.

Power on air before change is made  
 $Qp = 8000 (1.7 \times 5.2) = 70,720 \text{ ft.-lb. per min.}$

Natural division of air, before change: Assuming that each split has the same cross-section, the perimeter ( $\phi$ ) and area ( $a$ ) are constant for all the splits, and, since the pressure is the same in each case, the quantity of air passing in each airway is inversely proportional to the square root of the length of the airway. The relative lengths 6, 10, 21 can be used in this calculation; thus,

Split A, 6,000 ft.	$\frac{1}{\sqrt{6}} = 0.4082$	relative potentials
Split B, 10,000 ft.	$\frac{1}{\sqrt{10}} = 0.3162$	
Split C, 21,000 ft.	$\frac{1}{\sqrt{21}} = 0.2182$	

Sum of potentials 0.9426

A,	$\frac{0.4082}{0.9426} \times 8000 = 3464$	cu.ft. per min.
B,	$\frac{0.3162}{0.9426} \times 8000 = 2684$	
C,	$\frac{0.2182}{0.9426} \times 8000 = 1852$	

Total quantity 8000

Assuming the power on the air remains constant, it is proposed to place regulators in splits A and B so as to equalize the air in all the splits; and the question asks what effect this will have on the water gage. It is necessary, first, to find the total quantity of air that the same power will pass in these three splits after the regulators are placed in A and B.

Since the quantity and the pressure are to be the same in each split after the regulators are in place, the power ( $Qp$ ) will be equal in each split; or  $70,720 \div 3 = 23,573 \text{ ft.-lb. per min.}$  Now, as there is no regulator in the open split (split C), the quantity of air pass-

ing in this split is proportional to the cube root of the power on the air. In other words, the quantity ratio is equal to the cube root of the power ratio; thus, calling  $x$  the new quantity passing in split C,

$$\frac{x}{1852} = \sqrt[3]{\frac{23,573}{1852 (1.7 \times 5.2)}} = 1.129 +$$

$$x = 1852 \times 1.129 = 2090 + \text{cu.ft. per min.}$$

(a) Since for any open split the pressure or water gage varies as the square of the quantity of air passing, the water-gage ratio is equal to the square of the quantity ratio. Then calling the required water gage after the change  $x$ ,

$$\frac{x}{1.7} = 1.129^2 = 1.275 +$$

$$x = 1.7 \times 1.275 = 2.16 + \text{inches.}$$

(b) Since the sectional area ( $a$ ) is not changed, the resistance ( $pa$ ) in A and B, and in fact throughout the mine, will be increased in the same ratio as the pressure or water gage, or as

$$\frac{2.16}{1.7} = 1.27 \text{ times.}$$

(c) The total quantity of air circulating in the mine would be, in this case,  $3 \times 3464 = 10,392 \text{ cu.ft. per minute.}$

## Timber Framing for Side Pressures

We are having a lot of trouble with our timbering because of the softness of the coal, which throws all the weight against the sides of the posts. The roof is a

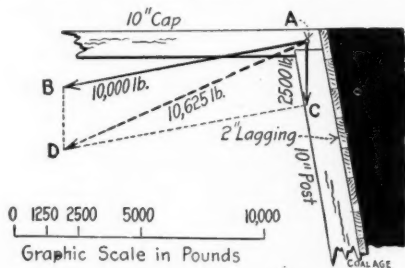


DIAGRAM OF FORCES IN A TIMBER SET

hard, sandy shale which seldom breaks, but settles hard on the pillars, squeezing them out against the posts. We use 2-in. lagging on the sides and 10-in. caps and posts.

We do not know what the pressures are, but think the side pressure is about four times that on the caps. In order to make the joint of the cap and post right, we would like to know the resultant direction of two pressures acting this way.

TIMBER FOREMAN.

The condition is not an unusual one in coal mines and the problem may be readily solved graphically. To fulfill the prescribed conditions a side pressure of 10,000 lb. on the posts and a vertical load of 2500 lb. on the cap will be taken, and it will be assumed that these loads act at the joint of the cap and post.

Draw the center lines of the post and cap, and at their intersection A, Fig. 1, draw AB perpendicular to the center line of the post. Make this equal to 10,000 lb. according to the graphic scale. Draw AC perpendicular to the center line of the cap, making it equal to 2500 lb. Now complete the parallelogram by drawing CD parallel to AB, and BD parallel to AC, and to the intersection D, draw AD, the resultant. AD shows the direction of the resultant of the two forces acting on the cap and post, and by scaling the length we find it equal to 10,695 pounds.

As will be noted, this resultant lies close to the roof and it would be interesting to hear from our correspondent, and others, as to the best method of framing timbers under these conditions.

## Which Is Better, Fuse or Squibs

I have long been accustomed to use a good quality of double-tape fuse, in blasting coal, but am told that it is much safer to use a squib. Kindly give me your opinion, as I think a good coal paper should explain this matter thoroughly.

A MINE FOREMAN.

Our correspondent will find the use of fuse and squibs in blasting coal quite fully explained on page 131 of COAL AGE, Nov. 4, under the headings, "Safety in Blasting in Mines," and "Hangfires in Blasting with Fuse." We would simply add here, never use fuse when a good safety squib can be procured. The reasons why the use of squibs is safer than that of fuse are the following:

Squibs are less liable to injury, or to contain imperfections that would cause the shot to misfire, or at least to hang fire for an indefinite period of time. A good squib, properly used, is more positive and reliable in its action, less subject, in its use, to the dampness of the mine, and permits the hole to be tamped quicker and better than fuse. Squibs are cheaper than fuse. They do not permit an unscrupulous miner to overcharge his hole and escape the possible chances of trouble, which he can often do, to the jeopardy of his fellows, when fuse is allowed.



# DISCUSSION by READERS

*Comment, Criticism and Debate upon Previous Articles, and Suggestions from the Experience of Practical Men*

## Handling Mine Cars in Pitching Seams

In anthracite mining, owing to the nature of the formation, the seams or "veins" of coal, as they are commonly called in Pennsylvania, are more or less highly inclined. The steep inclination of the haulage slopes or the roads in the chambers, makes the handling of the mine cars dangerous and calls for special and careful consideration in order to avoid, as far as possible, the accidents that occur so frequently, in this regard.

The mine foreman in a pitching seam is constantly confronted with the question of what will be a safe grade in an entry where mule haulage is employed; or, in what direction should the chambers be driven with respect to the pitch of the seam in order that the cars may be safely handled by the miner in his room. As the pitch of the seam increases, the chambers are often driven at a greater or less angle with the strike of the seam or the gangway, so as to reduce the grade of the roads in the chambers. When, however, it is impossible by this means to obtain a safe grade for handling cars in the chambers, the mine foreman must decide what means can be adopted to lower the cars more safely from the face of the chamber to the gangway. These are interesting questions, that are more easily solved when we understand a few of the principles involved. Some of these principles will be briefly explained in the following:

### FIRST PRINCIPLE—CARS MOVED BY GRAVITY—GRAVITY PULL

The force of gravity acts vertically downward. This force acting on the car gives it weight. When the car stands on a level track, see Fig. 1, the weight of the car acts in a direction perpendicular to the track, and is wholly balanced by the resistance of the rails. There is, in this case, evidently, no force acting to move the car along the rails.

When the car is on an incline, see Fig. 2, the weight of the car  $OW$  still acts vertically downward, but is not now perpendicular to the track. In this case, the weight  $OW$  is resolved into two forces; one  $OP$  parallel to the track, and the other  $ON$  perpendicular to the same. The force  $OP$  acts to move the car along the rails and is the *gravity pull*;  $ON$  is the *normal pressure* of the car on the rails, and is wholly balanced by the resistance of the rails.

From the construction of the figure, angle  $PWO =$  angle  $WON =$  angle of inclination of road  $CAB$ ;

$$OP = OW \sin PWO;$$

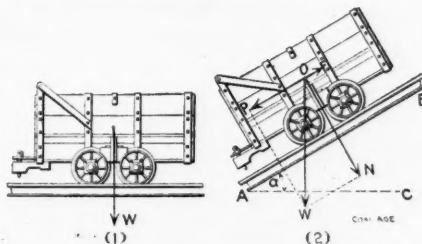
$$ON = OW \cos WON.$$

**Rule**—On any inclined plane or road the gravity pull equals the weight of the car multiplied by the sine of the angle of inclination of the road. Normal pressure on rails equals the weight of the car multiplied by the cosine of the angle of inclination of the road.

**Example**—What is the gravity pull of a loaded car weighing 3 tons, on an incline when the angle of inclination is 30 degrees; and what is the normal pressure of the car on the track?

**Solution**—The weight of the car is  $3 \times 2000 = 6000$  pounds.

Gravity pull,  $6000 \times \sin 30 \text{ deg.} = 6000 \times 0.5 = 3000$  pounds.



SHOWING FORCES ACTING ON CAR

Normal pressure on rails,  $6000 \times \cos 30 \text{ deg.} = 6000 \times 0.866 = 5196$  pounds.

### SECOND PRINCIPLE—MOVEMENT OF CAR RESISTED BY FRICTION—FRICTION PULL

When starting a car there is always a certain resistance due to the inertia of the car and adhesiveness of the moving parts that may be considerable. This starting friction cannot be estimated accurately, as it varies greatly. It may be several times the actual rolling friction when the car is in motion.

What may be called, for our purpose, the *rolling friction*, however, is more uniform. It may be estimated closely as a fraction of the normal pressure of the car on the rails. If the track or road is level, or has only a slight inclination, the frictional resistance or *friction pull* is a fraction of the weight of the car. On an incline, however, to be accurate, this must be multiplied by the cosine of the angle of inclination of the road.

The friction pull always acts parallel to the track and in a direction opposite to that in which the car is moving; it is represented by  $OF$  in Fig. 2. The ratio of the friction pull to the weight of the

car or the normal pressure on the rails, as the case may be, is called the coefficient of friction. In mining practice, the coefficient of friction may vary according to the condition of the rails and wheels from  $\frac{1}{50}$  to  $\frac{1}{25}$ ; or, expressed decimally, 0.02 to 0.04. Calling this coefficient  $c$ , we may assume for an average value, under ordinary conditions of mine-haulage roads,  $c$  equals 0.025, making the friction pull  $\frac{1}{40}$  of the weight of the moving load or the normal pressure on the rails, as the case may be.

Friction pull, level road,

$$OF = c \times OW.$$

Friction pull, inclined road,

$$OF = c \times ON = c \times OW \cos a,$$

in which  $a$  is the angle of inclination of the road.

**Example**—What would be the friction pull, in ordinary mining practice, of the 3-ton loaded car mentioned in the previous example, (a) on a level haulage road, (b) on a haulage slope having an inclination of 30 degrees?

**Solution**—Assuming the coefficient of friction as  $c = 0.025$ ,

(a) Friction pull, level road,

$$F = 0.025 \times 3 (2000) = 150 \text{ pounds.}$$

(b) Friction pull, 30-deg. slope road,

$$F = 0.025 \times 6000 \times \sin 30 \text{ degrees.}$$

$$F = 0.025 \times 6000 \times 0.5 = 75 \text{ pounds.}$$

**Note**—(1) On an incline, the friction pull is always less than on a level road, for the same load. For the same load, the friction pull decreases as the angle of inclination increases, but not in the same proportion. In a vertical shaft, the friction pull is practically zero. (2) On a level road, the friction pull is equal to the drawbar pull; but on an incline, the drawbar pull of an ascending car or trip is equal to the sum of the gravity pull and the friction pull.

**Example**—Assuming the same value for the coefficient of friction as before, what is the drawbar pull of the 3-ton loaded car mentioned in the two previous examples, (a) on a level road, (b) on a slope of 30 degrees?

**Solution**—(a) Drawbar pull, level road,

$$P = F = 150 \text{ pounds.}$$

(b) Drawbar pull (30-deg. slope),

$$P = 3000 + 75 = 3075 \text{ pounds.}$$

**Note**—On a level road, or a slope road, the drawbar pull is always the pull on the haulage rope. It should be carefully noted, however, that when cars are being lowered on an incline, engine plane or gravity road, the load on the rope is

equal to the gravity pull less the friction pull; because, in this case, the cars are moving down the incline, while, in the example given above, the car was being hauled up the slope. When hoisting the friction pull acts in the same direction as the gravity pull, but when lowering the cars, the friction pull acts in the opposite direction to the gravity pull.

MINE ENGINEER.

Birmingham, Ala.

## From the Ranks

### A FIREBOSS' SUGGESTION

As I have had a good deal of experience in firebossing in mines in the Pittsburg district, I want to write a few lines and hope you will publish them in your paper as I am a subscriber and reader of COAL AGE.

A fireboss is a man who must get out of his bed, in the dead hour of night, whatever the weather may be, and proceed to examine the mine or district in his charge. It is dangerous work, and must be done and the mine reported safe before the men are allowed to enter for the day's work.

When an explosion occurs, as it will at times, and the fireboss is killed, many say it was because he did not do his duty properly. Those who are so quick to lay the blame on the poor fireboss do not understand the peculiar conditions under which he is obliged to work. He must obey the law or he is liable to be arrested and prosecuted by the mine inspector. Also, he must do what the company wants or he will be discharged. In many cases the company wants to get along without doing all the law requires.

There are many firebosses who are afraid they will lose their jobs, and are willing to do anything that the mine foreman or superintendent asks, and run the risk of accident and the consequences of the mine law. Some of these men are personal friends of the officials, and work to suit them without regard to the law, or their own individual responsibility under the law.

The mine law (bituminous, 1911), Article 5, Section 6, makes the fireboss responsible for a "false report" of the condition of any place or portion of a mine allotted to him for examination; and for such "misdemeanor," makes it the duty of the mine foreman to suspend him and report his name to the mine inspector for prosecution. This act virtually shifts the responsibility for the security of the mine and the safety of the men from the fireboss to the mine foreman; for what mine foreman, having gotten his firebosses to disregard the condition of any section of the mine and admit the men for work, will report the matter to the inspector, *unless an accident results; and then the whole blame rests with the fireboss who*

*sold himself to make "a false report."* Can a worse condition be imagined than to be obliged to work thus, when any day the fear of the loss of his place will induce an honest fireboss to do violence to his conscience and run the risk of bringing disgrace upon himself and his family?

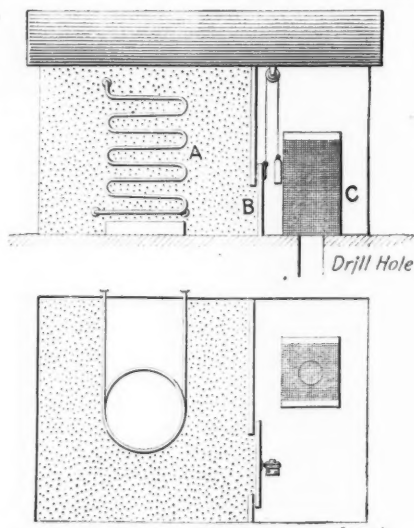
I never wrote to a magazine before, but do so now to make one suggestion. It is this: For the safety of the men and property concerned, the fireboss should be a government officer, appointed under the government and commissioned by the same for the daily examination of the mine, under the supervision and control of the district mine inspector. The fireboss would then be able to perform his duties, in the inspection of the mine, without fear or favor, and the three-cornered condition that now exists between the mine inspector, mine management and the fireboss would be at an end.

FIREBOSS.

Western Pennsylvania.

## Sand House to Supply Mine Motors

The accompanying cut shows the arrangement of a sand house, or sand box, for supplying sand direct to the mine for the use of the mine motors. It consists



SAND HOUSE TO SUPPLY SAND TO MINE MOTORS

of a wooden box, or a small frame building or shed can be built, if desired, on the surface, immediately over a 4- or 6-in. drill hole that is sunk from the surface to a point in the mine most convenient for supplying sand to the motors.

The sand is delivered by cars or wagons, and unloaded into the box at A. In this portion of the box there is a steam coil arranged to dry the sand. As sand is required in the mine it is shoveled from the trap-door marked B onto the sieve C which screens out all coarse stones, gravel and sticks, and thus prepares the sand for use in the motors.

The screen C stands immediately over the drill hole through which the sand falls into the mine. This arrangement has proved a considerable benefit in the saving it has effected in the cost of handling sand. The cost of handling the sand before this arrangement was instituted was \$1 per day. By the present arrangement it takes just 30 minutes to get the sand down into the mine, at a cost of 15 cents per day.

J. B. F.

Drakesboro, Ky.

## Inclined Plane Haulage

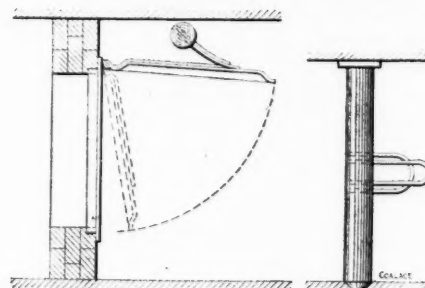
In reading your issue of Oct. 21, I notice in the description of the Castle Valley Coal Company's plant, at Price, Utah, the writer gives the manufacturers of the different classes of machinery installed, but has inadvertently omitted to state that the inclined-plane haulage at this plant, which is one of the largest planes installed under the most severe conditions, is equipped with our machinery. I know you will gladly give me space in your valuable paper to make this statement.

S. B. STINE.

Osceola Mills, Penn.

## A Simple Device for Closing Air Doors

The device shown in the accompanying sketch, is successfully used in some German mines. Two short lengths of wire rope are bent, each in the form of the letter U and fastened, one outside the other, into holes drilled for the purpose



ROPE LOOPS FOR CLOSING AIR DOORS

in a mine prop. The rope is secured in these holes by means of wooden wedges. When the door opens against the loops, the elasticity of the rope is sufficient to act as a spring and close the door. With wooden doors the loops are best fastened to the frame of the door itself.

W. HARTMAN.

New York City.

Experience has shown that whenever practicable, triangulation gives the best results in surveys for the development of large coal properties.



# EXAMINATION QUESTIONS and ANSWERS

*To Encourage, Assist, and Instruct Those Preparing for Firebosses, Mine Foremen, and Inspectors Examinations, Selected and Original Questions Are Carefully Answered And Fully Explained*

## Glen Jean, W. Va., Examination

### SELECTED FIREBOSS QUESTIONS

**Ques.**—What would you do in the event of an explosion that had destroyed your ventilation, in order to rescue the living and recover the bodies of the dead? Explain fully and in detail.

**Ans.**—Much will depend on conditions not stated in the question. If both shafts are belching smoke, dust and gas, and there is no other entrance to the mine available, it would not be wise to attempt to enter, for a time at least, even with breathing or rescue apparatus. Start at once to repair the fan or to install a temporary ventilator. After a time one or the other of the two openings will show signs of downcasting. Advantage should be taken of this, and as soon as possible the ventilator should be connected and run as an exhaust or blower so as to assist the natural tendency of the circulation as shown by the discharge from the shafts.

In the meantime every effort has been made to organize and equip two rescue parties under the leadership of experienced men acquainted with the mine. Descent into the shaft with the rescue apparatus is made at the first opportunity that promises a reasonable degree of safety, in order to ascertain the condition below and if possible assist the air-current by the removal of any obstruction blown into the airway; or extinguish smoldering fires that only need fresh air to burst into flame. The work is extremely dangerous and requires the cool, experienced action of brave men, whose judgment will be their greatest safeguard. As soon as practicable, the air-current having been started, the other rescuers follow; the men equipped with breathing apparatus and electric lamps going ahead, and the others following with safety lamps as fast as the air-current can be established. No advance must be made by these men ahead of the current.

**Ques.**—What instruments are used to properly determine the condition, volume and temperature of the air-current in a mine? State fully the principle and application of each.

**Ans.**—The safety lamp, hygrometer, anemometer, watch and measuring tape, and the thermometer. The safety lamp depends on the cooling effect of the wire gauze surrounding the flame or protecting the openings of the lamp. The cool metal of the gauze extinguishes any flame that

would otherwise pass through the mesh. The mixture of gas and air enters through openings and burns freely in the lamp; but the flame of the burning gas cannot pass out to ignite the gas outside the lamp, unless the gauze is defective or becomes heated, or the lamp is improperly handled.

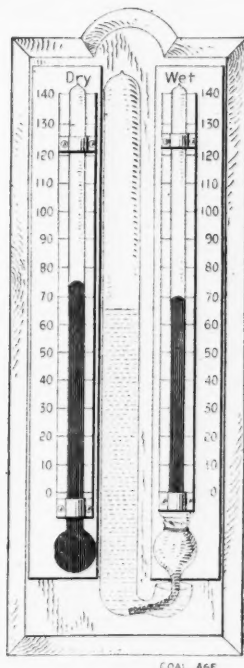


FIG. 1. THE HYGROMETER

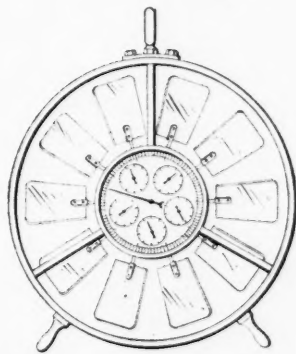


FIG. 2. THE ANEMOMETER

The hygrometer, sometimes called the psychrometer, consists of two standard thermometers mounted on a frame, as shown in Fig. 1. The bulb of one of these thermometers is kept wet by a sack of muslin, which is tied over it and which terminates in a wick that dips into a water bath below. The evaporation of water from the sack covering the bulb lowers its

temperature; so that the reading of the wet-bulb thermometer is lower than that of the dry-bulb thermometer. The difference of the two readings indicates the degree of saturation of the air. When the air is fully saturated no evaporation takes place and the readings of the two thermometers are the same.

The anemometer (Fig. 2) is a vane set in a metal frame and connected by a series of gears with the hands on a registering dial. The blades of the vane are inclined at such an angle that one revolution of the vane corresponds to one lineal foot of air-travel. The dial registers the number of revolutions of the vane and therefore the distance the air travels in the time the instrument is exposed to the current. This time is noted by the watch. The velocity of the air-current, in feet per minute, is thus determined. The sectional area of the airway where the observation is taken is measured with the tape and this area, in square feet, multiplied by the velocity of the air, gives the air volume, in cubic feet per minute.

The temperature of the mine air is made known by the reading of the dry-bulb thermometer.

### SAFETY AND EFFICIENCY OF BOILERS

**Ques.**—What are the principal boiler fittings designed to increase the safety and efficiency of the operation of boilers? Explain briefly the purpose of each.

**Ans.**—The safety valve, water-gage, gage-cocks or try-cocks, steam gage, fusible plugs, mud-drum, blowoff valves and feed-water heater. The safety valve is a valve generally attached to the steam dome of the boiler to automatically relieve the steam pressure in case the latter rises above a certain point; the steam gage is to indicate the pressure of the steam in the boiler. The water-gage and gage-cock or try-cock are to indicate the level of the water in the boiler, while the fusible plugs, by melting when the water level falls below a certain fixed point, give warning by the escape of the steam into the firebox. The mud-drum is for the purpose of collecting the sediment that accumulates in the boiler, while the blowoff valve is used in cleaning the boiler by blowing out a portion of the water, under pressure. The feed-water heater is used to heat the water before it enters the boiler, which results in a large saving of fuel and in many cases, also, helps to purify the water.

# SOCIOLOGICAL DEPARTMENT

*A Bureau Devoted to the Welfare of Miners Everywhere, and Especially Designed for the Betterment of Living Conditions In Mining Communities—COAL AGE will be Glad to Print Any Suggestions or Ideas of Value to this Department*

## Liquor Problem in Mining Communities

BY C. L. FAY\*

While considering the fact of a liquor problem in mining communities it is instructive and interesting to note the sentiments of captains of the coal-mining industry.

A general manager of one of the largest anthracite companies said recently, "We know there are entirely too many saloons and that the use of liquor seriously affects not only the operation of the mines but also the welfare of the men and their families. If I had my way, there would not be a place to sell liquor or any way of getting it within 100 miles of any of our operations. I can see no good whatever in the saloon."

"It is said that the men need a place to visit for recreation and for social purposes. The base-ball field, Y. M. C. A. rooms, pool and billiard rooms without the liquor attachment, and the garden, will give a man all the recreation he requires. If he wants to meet good people, he can go to church and Sunday school or a lodge of one of the many reputable organizations."

### ANOTHER PERSONAL VIEW

The president of one of the largest bituminous coal operations in Pennsylvania and West Virginia says: "I think the best thing would be to eliminate or prevent the manufacture of liquors."

"As long as liquors are made and permitted to be shipped into a community, I think that a licensed saloon properly conducted is the best regulator of the traffic."

"I find that when no saloons are near our mines, the employees bring in whisky by jug and beer by the keg or barrel, and often have orgies that last for a week at a time, but I find that where saloons are properly conducted, the miners go in and get a glass of whiskey or beer and then go about their business, thus preventing these orgies that occur where the men buy by the barrel, keg and jug."

Very good. There is truth and logic in both views, but let us place the average mining-town situation alongside the statements.

In the first place, the average mining town does not possess a Y. M. C. A. building and equipment. Too often the gar-

dens are backyards of mud and rocks and too small to be converted into plots that will "produce."

The fields are side hills strewn with boulders or covered with scrub oak or other bushes, while the "flats" are masses of culm. Pool and billiard rooms without liquor "available" are somewhat of a myth and at best are permeated by an immoral influence that is as vicious as liquor is detrimental.

### THE SALOON FAILS TO REGULATE LIQUOR TRAFFIC

Experience has demonstrated that the saloon is a failure as a regulator of the liquor traffic, at least under the operation of existing laws.

In the best equipped mines, there will be a maximum of loss in operation, unless back of that equipment, the human factor is ever vigilant and persevering.

The same thing applies to the liquor and social-welfare problems in the mining community. No matter how excellent the methods, or how suitable the equipment to attract men and divert their thought and energies from dissipating habits, the endeavors will fail unless the coal-company officials constantly exert the same efforts to get maximum efficiency from the social-welfare equipment, that they employ to get the highest efficiency from mine equipment. An industrial corporation will secure the best results, when utilizing or coöperating with various welfare movements, by insisting upon a definite working relationship.

The liquor problem is an economic one in the matter of operating mines, and until the coal companies fully recognize the fact that it must be dealt with in a business way as any other business problem, the average mine will continue to operate at a loss in tonnage of 5, 10 and 15 per cent. every month.

I will conclude this series of articles next week with a description of the Greenwald Welfare Committee as promoted by the Donahoe Coke Company at Crabtree, Pennsylvania.

### The Pancoast Relief Fund

The beneficiaries of the Pancoast disaster relief fund received their first payment Wednesday, Nov. 9, at the Anthracite Trust Company's banking rooms in the Mears building, Scranton, Penn.

The relief committee furnished to the trust company the amounts each beneficiary was to receive, and the trust

company adopted the following plan of identification and disbursement:

A photographer went the rounds taking a picture of each one entitled to payment. The beneficiary had to be properly identified before the picture was taken.

Each beneficiary's picture was pasted upon the ledger page of his or her account, and when he or she came for the money, the picture spoke for itself.

The relief committee does not issue checks or warrants. It simply supplied the trust company with an official list of the payments to be made, and the trust company drew its check for each individual payment.

### Scranton Mining Institute Banquet

The third annual banquet of the Scranton District Mining Institute, held in Scranton, Penn., on Oct. 21, was attended by over 1600 men, representing every phase of the coal-mining industry from driver boys to general superintendents and presidents of companies.

Addresses were made by Judge H. M. Edwards, toastmaster; C. E. Tobey, president of the Institute; Major Everett Warren; William H. Truesdale, president of the Delaware, Lackawanna & Western railroad, and others. Mr. Truesdale congratulated the association on its growth and on this remarkable meeting which he found interesting, instructive and inspiring, and went on to point out that from operators and managers down to the humblest mine worker, all were comrades in prosecuting a great industry.

Mr. Tobey gave a short history of the Institute from its organization in 1903, to the present time, dwelling particularly on its wonderful growth in the past year from a membership of 142 to a total of 1756.

### The Raleigh Mining Institute

On Wednesday night, Oct. 25, a banquet was given by the Raleigh Mining Institute in the new R. M. I. building, at Raleigh, W. Va. This institute was organized in October, 1908, for the purpose of studying practical and scientific methods of operating coal mines, in order to better fit the officers and employees of the Raleigh Coal and Coke Company, to perform their duties and assume the responsibilities thrust upon them, for the betterment of conditions, more efficient mine management and the preservation of life and property.

\*Secretary, Coal Mining Institute of America, Wilkes-Barre, Penn.

NOTE—This is the fourth article discussing the above subject.



The institute began with a membership of 12 persons. Today the Raleigh Mining Institute has a membership of 38, composed of the managing officials and the foremen of the Raleigh Coal and Coke Company, and Lance B. Holliday, inspector of the 9th district, West Virginia Bureau of Mines.

On the night of the banquet, this organization met in regular session and was called to order by President James P. White, general superintendent of the Raleigh Coal and Coke Company. The institute proceeded to elect Ernest Chilson, general manager of the Raleigh Coal and Coke Company, toastmaster, to preside over the banquet. The applications for membership of J. W. Heron, chairman Chesapeake & Ohio railway allotment commission; James Clark and D. R. Phillips, his associate commissioners;

### A New First Aid Packet

By GEO. B. PARKER AND B. T. POLLARD

A new type of first-aid packet is about to be adopted by the Colorado Fuel and Iron Company for use in its mines. This packet (the invention of Dr. Gates) consists of two pieces of hard tin with smooth edges. Each piece of tin measures about 3x8 in., and is adapted for use as a splint. These two splints have lugs soldered thereon with attached strips of webbing suited for securing the tin plates to either side of a fractured limb. The lugs are turned inward and are arranged to be at reverse ends of the packet. In this manner they act as spreaders. An aseptic bandage is placed between the tin plates and an air-tight strip of soft solder is run around the edges so as to make an airtight packet.

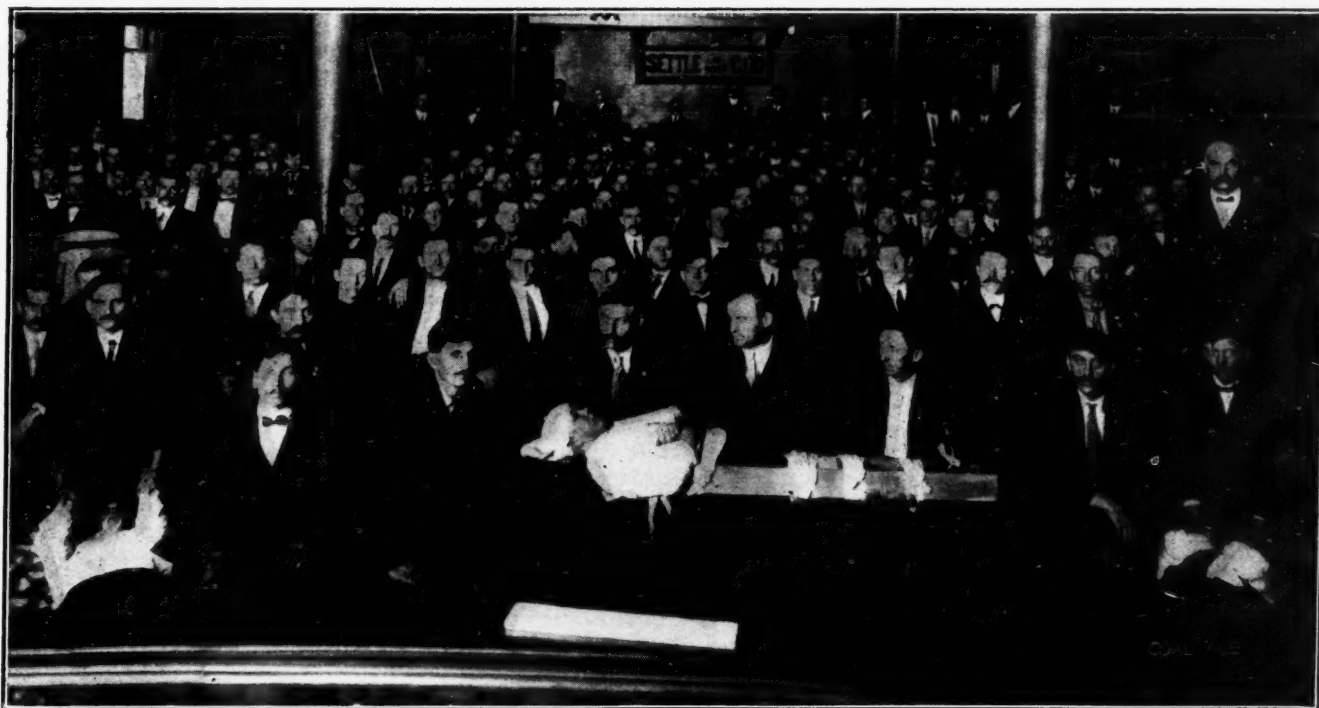
### First Aid Hints

By all means give your patient air. It is the safest and cheapest drug in the *Materia Medica*. Stand back if you are not needed and let nature do its work.

Roller bandages for the fingers should be  $\frac{3}{4}$  in. wide and 3 to 4½ ft. long; for the arm and head 2½ in. wide, 3 to 6 yd. long; for the body and legs 3 in. wide, 6 to 8 yd. long.

If your patient, overcome by gas, is breathing, but can't walk around, don't drag him. Lay him out with his back on a flat surface. Roll a coat and place it under his shoulders and neck, so that his windpipe is straight. That will give him a chance to breathe without labor.

If you have been exploring after an explosion and come out with your lungs full of gas, nauseated and with a head-



UNIONTOWN SECTION OF H. C. FRICK COKE COMPANY'S FIRST AID CORPS, TAUGHT BY DR. M. J. SHIELDS, AMERICAN RED CROSS SOCIETY

Prof. E. W. McDairmaid, of Beckley Institute; George W. Stevens, Jr., youngest son of President George W. Stevens, of the Chesapeake & Ohio Railway Company; A. F. Beck, general manager of the Charleston Electrical Supply Company, and Professor J. A. Thompson, of Glenleigh Schools, were read and approved and the applicants were duly elected and enrolled as honorary members of the Raleigh Mining Institute. Upon motion, the meeting was adjourned and the members entered the banquet hall, where the address of welcome was delivered by the toastmaster. Tables were set for 150 persons. After the dinner, interesting addresses on diverse mining subjects were delivered by various members of the institute.

In the side of the tank of a dinner pail a round hole is made and the packet is soldered to the pail through this hole. If the splints are torn from the pail, the tank is rendered useless and this fact is expected to make the miner or laborer apply for another. It is considered unlikely that any miner or laborer would be overcome by an accident without a first-aid packet being available as it is customary always for the workmen to take their pails with them when they are transferred from place to place.

The soft solder can be easily removed, leaving a splint without ragged edges. One important feature of this appliance is that it can be put into water and washed with the dinner pail without injury to the aseptic bandage.

ache, you will want to sit down on a step and hold your head as people with sick headaches, and feeling weak at the stomach naturally do. Resist the impulse, get up and call a friend or two and let them walk you around. Get air into your lungs, hold up your head, take in deep breaths; don't constrict your lungs. No good will come of doubling yourself up. It is not rest or quiet you need so much as fresh air and a gentle stimulus.

**ERRATUM**—In our issue of last week, there appeared in this department a photograph captioned, "Banquet of Wilkes-Barre Mining Institute." The view in question was a photograph of the "Scranton Mining Institute Banquet," the word Wilkes-Barre having been printed by mistake.—EDITOR.

# COAL and COKE NEWS

*Editorial Correspondence from our own Representatives in Various Important Mining Centers, and a Record of Legislative and Other Action Affecting the Coal Industry*

## Washington, D. C.

### ALASKAN COAL AND THE ADMINISTRATION

Secretary Fisher has had a consultation with President Taft for the purpose of discussing the policy of the Government in regard to the treatment of coal deposits in Alaska. Mr. Fisher has prepared and submitted to the President the details of his plan, which provides in substance that the coal shall be owned in perpetuity by the Government and that the leasing system shall be adopted for the control of the coal properties. The Secretary has discussed with Mr. Taft the form in which the recommendation should be made and has indicated the extent of the concessions to private interests which he believes may be made with advantage in order to induce them to undertake the exploitation of the coal.

It is probable that progressive members of Congress will lend their support to the leasing system and will not attempt to antagonize the main feature of the program of the Administration. They will, however, it is believed urge great modifications in the details with a view to what they consider the more effectual protection of the interest of the public in the lands.

### WAR DEPARTMENT COAL PURCHASES

The Quartermaster General of the Army has just completed a report to the Secretary of War on the subject of coal purchases for the army in which he reviews the experience during the past year or two with the present system of purchasing and recommends new legislation to govern the purchases henceforward. It is not certain whether this legislation can be obtained but it is expected that Secretary Stimson will have the proposed change incorporated in the new army appropriation bill.

The report says in part: "In view of the excess prices frequently submitted by bidders for fuel over that at which fuel may be purchased in the open market, especially upon the Pacific coast, for that required in Alaska, and for use of transports, it is suggested that recommendations be made to the Secretary of War for enactment of legislation giving the Secretary of War authority to purchase, as in his discretion may be deemed for the best interests of the service, and in view of this suggestion the following draft is submitted: 'The Secretary of War, in making contracts and purchases, shall give the preference, all other things, including price and quality,

being equal, to articles of the growth, production, and manufacture of the United States. In purchasing fuel and forage for the Army, particularly with reference to Alaska and island stations, the Secretary of War shall have power to discriminate and purchase, in such manner as he may deem proper, that kind and quantity of fuel and forage, not to exceed the supply necessary for a single fiscal year, as shall be best adapted to the purpose for which required.'"

The report further on, reads: "Attention is invited to the fact that the price for delivery of anthracite coal advances from April to August approximately 50c. per ton, and if authority of law and appropriation could be obtained for the purchase of anthracite coal in April for the succeeding fiscal year it would, based upon the consumption for fiscal year 1911, effect an annual saving of approximately \$60,000, being about 8 per cent. saving on purchases of anthracite coal; this on the presumption that storage space for a year's supply is available at all posts using anthracite coal."

Upon the suggestion of the Geological Survey, in May, 1910, the Quartermaster's office took under consideration the question of purchasing coal for use of the Army based upon its heating value as expressed in British thermal units. The method then pursued was to purchase coal on its fuel equivalent, in which case the actual test of each coal was necessary before contractors could bid on same. After a careful consideration of the matter, the proposed method was approved by the Secretary of War in December, 1910, and all coal for the Army for the fiscal year 1912 has been purchased under this system. The question of extending this B.t.u. system to the Philippine islands is now under consideration.

## Alabama

**Birmingham**—The Woodward Iron Company, of Birmingham, has purchased the properties of the Birmingham Coal and Iron Company, including 40,000 acres of coal lands, 2400 acres of high-grade ore lands, two blast furnaces, the mining town of Mulga and other properties. It is said that the deal represents \$7,500,000, and that developments on a large scale are anticipated.

The Jefferson Coal Company, of Jefferson county, has filed in the United States court a petition in voluntary bankruptcy.

In the absence of a quorum of the reorganization committee, formal ratification of the merger of the Southern Iron and Steel Company and the Alabama Consolidated Coal and Iron Company, which was to have taken place Nov. 10, was indefinitely postponed. That the merger will soon become operative, however, is evident from the fact that the committee has received deposits of from 60 to 70 per cent. of the various securities of the two companies.

The new stockade of the Pratt Consolidated Coal and Iron Company at Flat Creek will not be ready for occupancy until the first of the year, and the State of Alabama will probably not be able to take charge of the Banner mine of that company under the lease entered into a short time ago until Jan. 1. The State was to begin the lease about Nov. 15, and work the mine with State convicts.

## California

**San Francisco**—The Clear Lake Coal Company has been incorporated to develop a coal prospect in Lake county. The property consists of 1920 acres of Government land, on which a force of men, with an engine and pump, are sinking a shaft; the work is reported to be progressing satisfactorily.

The mine of the Stone Cañon Coal Company, in Monterey county, has been closed for more than a year. The company now is sinking the slope, previously worked at the 300-ft. level, to a depth of 1000 ft. and expects to mine coal from this level and market it about Jan. 1. The vein is alleged to be 14 ft. thick and to contain several million tons of good merchantable coal. The work of rebuilding the railroad, washed out in the spring floods of 1910, is progressing satisfactorily.

## Illinois

**Springfield**—The Livingston mine of the New Staunton Coal Company, claims the tonnage record for the State. There were hoisted during the last half of October, 34,649½ tons, working 13½ days, making an average of 4029 tons per day. The record hoist, of Sept. 29, is 4265 tons, making 4192 trips and loading 105 railroad cars in eight hours. It is generally understood that Mr. Ross, of the Superior Coal Company's mine No. 3, at Gillespie, expects very shortly to beat these records for both day and week.



**Chicago**—The O'Gara Colliery Company, of Chicago, has been incorporated with a paid-up capital stock of \$100,000.

The company has a large tract of coal rights north of Harrisburg, in Saline county, and development has already been started. This concern is not to be confused with the O'Gara Coal Company, although it is understood that the two are closely allied.

**DuQuoin**—Official announcement has been made of an extension of the Burlington's Southern Illinois coal line to West Frankfort, in the heart of the Franklin county field. The extension will branch off from the main line, south of Christopher, and continue in a south-westerly direction for a distance of about six miles to West Frankfort. Practically all the right of way has been secured and the work of construction will be well under way by the first of December.

**Chicago**—Consolidation of the City Fuel Company and the Lill-Robinson Coal Company, forming the largest corporation for the retailing coal business in existence, was perfected recently at a meeting of officers of the two concerns.

The concern, which will be called the City Fuel Company of Illinois, will have a total capital stock of \$4,000,000. "The consolidation was effected solely for the purpose of economizing deliveries," said Fred W. Upham, the president.

## Indiana

**Indianapolis**—The miners employed by the Domestic Coal Company of Kokomo, which recently was placed in the hands of a receiver, have been paid in full. The mine, which is in excellent condition, will be kept in operation.

## Kentucky

**Louisville**—The organization of the Cambria Coal and Lumber Company, at Lexington, is said to mean that Pennsylvania capital is preparing to acquire immense areas of coal and timber lands in the mountain section of the State. Four companies, in all, have been organized. The capitalists back of the project have acquired 140,000 acres, and as individuals they hold 35,000 acres additional. The approximate value of the lands which they control is said to be about \$1,500,000. These lands are in Perry, Floyd, Magoffin and Knott counties.

The several companies are as follows: Kentucky Land and Improvement Company, which controls 40,000 acres; Cambria Coal and Lumber Company, 67,000 acres; Knott County Coal and Lumber Company, 23,000 acres; B. F. Price Coal and Lumber Company, 10,000 acres.

The town of Jenkins, Letcher county, which has sprung up since the Consolidation Coal Company opened its mines there, now has a population of 1200, an average of 200 persons a month. It is estimated that it will have a population of

5000 in a short time if the percentage of increase keeps up, which seems probable.

**Madisonville**—The biggest coal deal in the history of this county was made Oct. 30, when President Ross, of the Kentucky Bank and Trust Company, bought the I. Bailey tract of coal lands at the edge of Muhlenberg county, for \$23,000. The tract contains 4600 acres.

## Montana

**Roundup**—Recently a new record was established by the Roundup Coal Mining Company's mine No. 3 at Roundup in the amount of coal hoisted in a single day. The mine is being worked at full capacity with a crew of 304 men and in one day of eight hours 1504 tons of coal were mined and loaded. Also a new record was established by mine No. 2 of the Republic Coal company, employing a force of 410 men, when 2020 tons of coal were mined and loaded in one day of eight hours at this property.

## Ohio

**Columbus**—The bonded indebtedness of the Sunday Creek company is no longer backed by the Hocking Valley Railroad Company, as is disclosed by the last fiscal report of the latter. This is in conformity with a decision of the courts on ouster suits compelling divorcement between the railroad and coal properties.

The Meister Coal Company of Fushing, Belmont county, has been incorporated with a capital of \$75,000 to mine and sell coal.

**Bridgeport**—The movement toward the consolidation of practically all the big coal companies in eastern Ohio has taken on definite shape. The proposition is up to the syndicate which will furnish the money and a favorable reply in anticipated. The consolidation would embrace 11 or 12 of the largest companies in the eastern half of the State and about \$25,000,000 would be involved. It is said the proposed organization would virtually control the output from the district and would be able, in a measure, to fix prices.

## Pennsylvania

### BITUMINOUS

**Punxsutawney**—Eight men perished in an explosion in the Adrian mine of the Rochester and Pittsburg Coal and Iron Company shortly after 6 o'clock in the morning of Nov. 9.

With the aid of the rescue crew from the United States Bureau of Mines of Pittsburg, the rescue crew at the mine later took out six bodies, but was unable to penetrate to the seat of the explosion on account of the afterdamp and debris. Two other miners are believed to have perished under a crushing weight of fallen rock. The cause of the explosion and fire is as yet not definitely known.

The damage to the mine proper was slight.

**Altoona**—Bondholders of the Pennsylvania Coal and Coke Company met Nov. 10 at Philadelphia to ratify the plan for the reorganization of the company proposed some months ago. The plan provides for a foreclosure of the consolidated mortgage and a sale of the properties held by the receiver, which are not subject to the lien of the mortgage. The new company will be capitalized at \$7,500,000, and will be authorized to buy, lease and operate coal and other lands and sell their products.

**Boswell**—The Merchants' Coal Company is spending about \$100,000 in improvements, which will increase the output from 2000 to 3500 tons daily and give employment to 300 more men. The improvements include an enlarged tippie, two dumps for loading coal, new crusher, new fanhouse, new haulage engine, and an addition to the power plant to house a new generator and boilers.

**Cassandra**—According to authoritative information, work will soon be started on the opening of a new mine by the Shumaker & Hughes Company to tap a large coalfield lying north of this place.

### ANTHRACITE

**Scranton**—Shipments of anthracite in October amounted to 6,269,179 tons. This establishes a record for October, being an increase of 161,114 tons over the previous record for that month, made in 1907. Last month's shipments were 647,084 tons in excess of October, 1910.

The shipments from Jan. 1 to Oct. 31 amounted to 57,645,558 tons, as compared with 52,602,462 in the corresponding ten months of 1910, an increase of 5,043,096.

Incorporation papers were filed Nov. 8 by the Connell Anthracite Coal Company, capitalized at \$10,000. William J. Connell and James S. McNulty, both of Scranton, are directors.

Testimony in the equity suit of the Delaware, Lackawanna & Western Coal Company to recover \$90,000 from the North End Coal Company for coal alleged to have been illegally mined, was heard recently by Judge H. M. Edwards. It is alleged by the plaintiff that the North End company has violated the terms of lease by going beyond the boundary lines and taking 60,000 tons from the Lackawanna's property. It is asking 50c. a ton and treble damages amounting to \$90,000. The North End company will attempt to prove that it followed the lines laid down in the lease as closely as possible, and that if its operations did extend beyond the lines it was done inadvertently and that the coal mined did not amount to any substantial quantity.

**Shamokin**—The Pennsylvania railroad is storing a great quantity of coal at its new yards near Northumberland.

**Wilkes-Barre**—A mine cave recently occurred in a crowded street at Plains. The subsidence left a hole about 15 ft. wide, 20 ft. long and 20 ft. deep, and wrecked several houses.

**Pottsville**—The Alliance Coal Company, a subsidiary branch of the Lehigh Coal and Navigation Company, in the Panther Creek valley, has purchased the Maryd colliery from J. S. Wentz & Co.

**Hazleton**—It is understood that the proposed new Spring Brook washery of the Lehigh Valley Coal Company at Audenreid will be electrically operated throughout.

### Rhode Island

**Providence**—Operations at the Rhode Island Coal Company's plant have been started after a 10-days' suspension to permit double tracking of the slope and other improvements. The company expects to produce daily 500 tons of coal.

### Tennessee

**Nashville**—The Bon Air Coal and Iron Company plans to organize a new company with \$3,000,000 capital stock to take over and develop its properties, which include 38,000 acres of coal and timber land in two counties and 80,000 acres of iron and timber land in five counties of Tennessee.

**Memphis**—Special Examiner Anderson, for the interstate commerce commission, recently began hearing testimony affecting complaints against a 10 per cent. increase in the freight rate on coal shipped to Memphis from Illinois, Kentucky and Alabama by the Illinois Central, Louisville & Nashville and St. Louis & San Francisco railroads. The increase became effective April 1 last. Local coal consumers complained. A decision by the commission is expected in 90 days.

### Washington

**Palouse**—At a meeting of prominent business men of Palouse, a syndicate was formed to develop a coal find on the Ellsworth Bishop ranch, on Cedar creek, four miles north of here. It is announced that work will commence on the property at once, a contract having been already completed with an Idaho coal miner for sinking a 200-ft. shaft.

**Centralia**—Franklin A. Umstead, of Chicago, has purchased the Great Western coal mine, located a few miles south of Tenino. It is hoped that the sale will mean a big boost for lignite coal in this vicinity.

**Seattle**—The Mendota mine of the Mendota Coal and Coke Company is now producing 600 tons of coal daily. The property is located ten miles from Centralia and comprises 9000 acres which are underlaid by six workable veins. The seam being worked at present is 10 ft. thick.

## West Virginia

**Fairmont**—The Consolidation Coal Company recently established an office in London, and all foreign business will be handled from the European branch.

**Charleston**—The New River Collieries Company, operating the Sewell and Beckley seams in Raleigh county, is now shipping from four shafts, and has an output of 25,000 tons which it hopes to increase to at least 40,000 tons within the next two months. This company has 8500 acres under lease.

The incorporation of the Southern Collieries Company, of this city, for the purpose of mining coal and cutting timber in the Cabin Creek district of Kanawha county, means another large development along the Cabin Creek branch of the Chesapeake & Ohio railroad. The development of properties along that line during the past year has necessitated the practical reconstruction of the branch railroad in order to handle the coal and timber, but especially the coal. The Southern Collieries Company has an authorized capital of \$100,000.

### Canada

**Nova Scotia**—A renewal for two years of the agreement between the Dominion Coal Company and the Provincial Workmen's Association has been concluded. This renewal will hold good until the close of 1913, and is on exactly the same terms as the present agreement.

## PERSONALS

Edward Cameron has been appointed manager of the Natchez, Miss., office of the Pittsburg Coal Company.

O. D. Hogue has been appointed vice-president and treasurer of the Coulds Manufacturing Company, of Illinois.

E. P. Merrill, formerly at Pachuca, Mexico, is now in charge of the western business of the Island Creek Coal Company, with headquarters at Minneapolis.

P. C. Thomas, formerly a mining engineer with the Temple Iron Company and later with the H. C. Frick Coke Company, has been appointed chief engineer of the New River Company, with offices at MacDonald, West Virginia.

Waldemar Lindgren has been appointed chief geologist of the United States Geological Survey to succeed C. Willard Hayes, who recently resigned. Mr. Lindgren has been a member of the Federal Survey since 1884 and has been in charge of its investigations in metalliferous deposits since 1907. He is the author of some 50 reports published by the Survey, and in addition has contributed between 50 and 60 articles to technical and scientific journals. Mr. Lindgren is a trained mining engineer and has a world-wide reputation as an authority on the geology of ore deposits.

## OBITUARY

The death of J. K. F. Steele, of Keystone, W. Va., removed one of the pioneer coal operators of the southern section of the State. Mr. Steele came to West Virginia from Stewartstown Furnace, Penn., about 22 years ago, to enter the employment of the Indian Ridge Coal Company, and later became interested in the Keystone Coal and Coke Company, at Keystone, of which company he was general manager at the time of his death.

## NEW PUBLICATIONS

### BUREAU OF MINES

Bulletin 13. Résumé of producer-gas investigations, by R. H. Fernald and C. D. Smith. 1911. 378 pp., 12 plates.

Miners' Circular 5. Electrical accidents in mines; their prevention and treatment, by H. H. Clark. 1911.

Bulletin 24. Binders for coal briquets, by J. E. Mills. 56 pp. Reprint of Bulletin 343.

Bulletin 28. Experimental work conducted in the chemical laboratory of the United States fuel-testing plant, St. Louis, Mo., January 1, 1905, to July 31, 1906. Reprint of Bulletin 323.

Bulletin 27. Tests of coal and briquets as fuel for house-heating boilers, by D. T. Randall. 45 pp., 3 plates. Reprint of Bulletin 366.

Bulletin 35. The utilization of fuel in locomotive practice, by W. F. M. Goss, 28 pp. Reprint of Bulletin 402.

The Bureau of Mines has copies of these publications for free distribution, but cannot give more than one copy of the same bulletin to one person. Requests for all papers cannot be granted without satisfactory reason. Bulletins, 24, 27, 28 and 35 will not be sent to persons who received the original bulletins. In asking for publications please order them by number and title. Applications should be addressed to the Director of the Bureau of Mines, Washington, D. C.

### WEST VIRGINIA GEOLOGICAL SURVEY

Detailed County Report, on Wirt, Roane and Calhoun counties, 573 pages + XX, with case of 3 maps—topographic, geologic and soil—published under date of July 1, 1911, and now ready for delivery. Besides the detailed study and description of all the rocks, minerals, soils, streams, industries, etc., found within the area, the geologic map gives also the true location of all the oil and gas pools developed up to July 1, 1911, and shows by structural contours the several anticlinal and synclinal arches, including the southern extension of the famous Burning Springs or Volcano anticlinal. Price, with case of maps, postage paid by the Survey, \$2. Extra copies of geologic or topographic map, 50c. each. Order from the West Virginia Geological Survey, Morgantown, W. Va., Lock Box No. 448.



# COAL TRADE REVIEWS

## *Current Prices of Coal and Coke and Market Conditions in the Important Centers*

### General Review

The past week has witnessed a sharp flurry in the coal market, due to the first general break in the weather this season. The spot market has tightened in all sections, with prices firm, and a shortage in transportation facilities becoming acutely evident in some districts.

In the extreme East the market is normal generally, with a fair demand for spot coal of the better grades. A shortage in some sizes is appearing and the recent storms will, no doubt, stimulate the market all along the line.

The cessation of Lake shipments in the East has left the market unsettled, but the unprecedented fall in temperature will result in a heavy demand for domestic. Shortages in some sizes are reported, and dealers are beginning to consider the possibility of a strike next fall.

Ohio mines are estimated to be working 80 per cent. capacity, one of the strong features being the Lake trade. Transportation troubles are developing here and down through West Virginia, but not in serious proportions yet. It is believed 60 to 75 per cent. of present production is contract coal.

Through the Middle West conditions are variously reported as quiet or improving with an occasional instance of overstocking and weak prices. The Rocky Mountain States still continue with a heavy consumption, which is taxing the capacity of the mines and railroads. Pacific Coast operators are working full time with trade normal.

### Boston, Mass.

Bituminous seems to be marking time this week; there cannot yet be said to be a seasonable demand for spot coal, and contract requirements are steady enough to keep the situation generally firm. At the Virginia terminals \$2.60 f.o.b. remains the base price for Pocahontas and New River, with but few sales reported. There is not quite the rushing anxiety to get fuel forward that was evident ten days ago.

Arrivals have been better, and a supply of tonnage is in prospect, but freights continue firm at high figures, 90c. to \$1 being the rate to Boston, depending on size and draft.

Prices at Mystic Wharf on cars are from \$3.63 to \$3.68 on the better Southern coals. The cold wave reported to be on the way should cause a decided change

in the market here and we are likely soon to see higher prices along with higher freights. The textile mills are enjoying fair business, and general prospects are somewhat brighter.

In anthracite trade continues active. The better movement of boats is helping out, but barges are still short and the companies slow on delivery. Retail trade is brisk, and the demand for chestnut is still an important feature. Surprisingly little interest is shown in possible labor troubles next April and the dealers, outside of the points soon to be closed to navigation, seem only to be looking out for present needs. It is true that the companies seem to have their hands full looking out for those.

### New York

Market conditions here this week show but little change from those prevailing during the past two or three weeks. Railroad movement to New York tidewater, with few exceptions, is prompt and the supply at the piers is fully adequate to the demand, which on contract is good, although the movement from the piers is reduced to some extent by reason of the unfavorable weather for transportation on the sound. This has held back the boats considerably and delayed somewhat the movement from the piers.

The market for inferior coals shows no improvement whatever and some of these grades on demurrage are offered at sacrifice prices.

On new business the market is very dull. Consumers are getting all the coal required from contract sources so that the amount of new business coming into the market is about at a minimum. The possibility of labor trouble in the spring has as yet caused no decided increase in the demand for soft coal. This contingency will undoubtedly have a strengthening influence on the coal business in general as the first of April draws near. The excellent demand that has prevailed on contract this fall, may in some measure be traceable to this possibility. Rail business in this territory is in good condition and a large tonnage is reported as moving.

Prices obtaining in this market for steam coal, with the exception of the prices made to get rid of demurrage are unchanged from those previously reported, ranging f.o.b., New York, about as follows: \$2.35 for West Virginias

(80c. at the mines); \$2.35@2.45 for ordinary Pennsylvanias; \$2.55@2.65 for good Pennsylvanias, and better grade Pennsylvanias, \$2.65@2.75.

### Buffalo, N. Y.

The feature of the coal trade just now is the scarcity of both anthracite and bituminous. Anthracite dealers have complained of a lack, especially in stove, for some weeks, but bituminous has been plenty enough and it would be now, but for two features of the trade, only one of which will last. The miners have been badly demoralized of late, the hunting season, the Pittsburg convention and the election conspiring to keep them idle. The other difficulty is the growing shortage of cars.

The improvement in soft coal is still small. It will need to be much larger than it has been yet to affect prices, beyond preventing the offering of slack at all sorts of prices, as has been done through the summer. Slack is stronger now and if the Lake trade takes as much of it as it should there will be but a small surplus at the close of the Lake season and prices will continue to strengthen, though they are not likely to advance right away. It is believed that under normal conditions the natural supply is too large for that.

Some report is made of a prospective coal famine in the Northwest, especially Canada, the coming winter, but anthracite shippers say that they, at least, have enough on docks at the head of the Lakes, even though they do expect to have a call for it further west than usual, on account of the strikes in Rocky Mountain mines. So this condition will keep soft coal moving by Lake as long as the vessels can go. The condition of the closing Lake trade has much to do with the soft-coal situation during the early winter.

Bituminous prices remain fairly steady, except for slack, on the basis of \$2.50 for Pittsburg three-quarter, \$2.40 for mine-run and \$2 for slack, with Allegheny Valley about 25c. less. No stir is evident in coke, which is weak at \$4.25 for Connellsville foundry, to \$3.50 for stock.

The smithing situation is steady, a fair amount moving at \$4 for Georges Creek Cumberland and \$3.65 for Cambria county. The practice of using a large percentage of slack for smithing purposes keeps prices down.

## Pittsburg

**Bituminous**—The coal market is rather unsettled since the practical cessation of lake shipments, prices being somewhat more irregular, while production is restricted. Shipments to retail coal yards and to manufacturing consumers increased slightly this week. Genuine winter weather appeared with a suddenness that has rarely been paralleled, the temperature dropping over 30 degrees in a few hours and the movement in the domestic trade this week will undoubtedly be very heavy. We repeat former quotations, which represent approximately the average level of the market: Nut, \$1@1.05; mine-run, \$1.05@1.10; ¾-in., \$1.15@1.20; 1¼-in., \$1.25@1.30; slack 40@50c. per ton at mine, Pittsburg district.

**Connellsville Coke**—Sales of between 60 and 75 cars of furnace coke have been made in the past week, about 3000 tons, all at \$1.50. Several consumers have been buying an odd lot each week for several weeks past, which accounts for the steadiness in the sale of spot furnace. Otherwise the market is very dull. One furnace in the East goes out this week, but another goes in, while in the Central West the furnace operations are practically unchanged. Some negotiations have been on for furnace coke for next year. As a rule, buyer and seller are far apart, but one or two contracts may be closed within a few days. The majority of buyers seem to be inclined to wait for at least 30 days before going deeply into the matter of contracts. Many contracts, of course, run into or through next year. Foundry coke continues quiet, with fair shipments on contract. We quote: Prompt furnace, \$1.50@1.55; contract furnace (nominal), \$1.65@1.75; prompt foundry, \$1.80@1.90; contract foundry, \$2@2.25, per net ton at ovens.

The *Courier* reports production in the week ended Nov. 4 at 322,745 tons, an increase of 2000 tons, and shipments at 4058 cars to Pittsburg, 4933 cars to points west and 1043 cars to points east, a total of 10,034 cars, an increase of 907.

## Philadelphia

The week opened with a splendid effort on the part of the weather man to make matters easy for the retail trade. Temperature here dropped anywhere from 25 to 35 degrees, and, as a result, the dealers were swamped with new business, and urgent telephone calls for orders to be filled that were in hand. Shortage of coal is reported, particularly stove and chestnut, presenting an opportunity that the individual operators will hardly fail to take advantage of, by asking a premium for their product. All sizes are in good demand, and weather such as inaugurated the present week, is likely to cause a shortage all along the line. While

it is understood that the large companies have some stocks of the small sizes, yet they are entirely inadequate to stand any unusual drain upon them, and it is believed that the first of the year will see these stocks pretty well depleted.

The conditions in the wholesale market are good, and the outlook is more than promising. Shortage of coal is also reported in this branch of the business—following the whole list, with stove and chestnut as leaders. The heavy storm early in the week, has interfered very materially with the movement of coal at Tidewater, barges and vessels being very seriously delayed, which has upset calculations very much, but this will give the companies an opportunity to throw more coal into the local market, where it is urgently required. Compared with last year, it is reported that the companies show a very appreciable increase, and all are looking forward to another record-breaking month.

The bituminous trade took a little flurry in the way of better business, and it is also reported that Pennsylvania coals are advancing a trifle in price

## Baltimore, Md.

Although by no means active, market conditions in Baltimore during the past week have shown a slight improvement over previous weeks, and coal operators were more optimistic than they have been for months.

The demand for Pennsylvania and West Virginia coals was somewhat better, due to the fact that many buyers entered the market for winter coal. Others who were not in particular need of an oversupply, did some purchasing for storage purposes, believing that the coal operators will face trouble with the miners next April when their wage contracts expire.

What coal is being moved under contract, and otherwise, is delivered without delay. The railroads, including the Baltimore & Ohio and the Western Maryland Railroads, the two principal roads which supply this market, have kept traffic moving freely. There is no more talk of car shortages, which prevailed to such a large extent during the first six months of last year. The roads are well supplied with equipment, and can handle all business given them.

The coke market has shown but little life here for months, and at the present time, is exceedingly inactive. Most of the steel companies are entirely out of the market for the product, and orders are rare. Many coke ovens are idle on account of a lack of business.

## Cleveland, Ohio

There is nothing to relate, in regard to the lake-trade coal business, excepting there is a demand at the present time for medium-sized coal boats for cargoes to

Michigan points. There has not been any improvement in the steam or domestic business in the past week. The cause in the domestic demand is owing to the very mild weather, which has continued during the past week and up to the present writing.

Slack is the only commodity that has increased in demand and also in price. This has increased in the past 10 days from 15c. to 25c. per ton, and will still increase as the closing of navigation progresses.

The general impression among coal dealers is that conditions look very much better than they have for some time past. Prices range as follows, per ton:

<i>Ohio No. 8:</i>	
Mine-run.....	\$0.95@1.00
¾-in.....	1.05@1.10
1¼-in.....	1.15@1.25
Slack.....	0.55@0.65

<i>Middle District:</i>	
Mine-run.....	\$1.00@1.10
¾-in.....	1.20@1.30
1¼-in.....	1.45@1.60
Slack.....	0.80@0.85

<i>Youghiogheny:</i>	
Mine-run.....	\$1.10@1.20
¾-in.....	1.30@1.35
1¼-in.....	1.40@1.50

<i>Pocahontas:</i>	
Mine-run.....	\$1.00@1.10
Lump.....	2.10@2.25

## Columbus, Ohio

Conditions in the coal trade in all parts of the Buckeye State improved materially during the past week, the demand for the domestic grades has increased and prices are firmer all along the line. The chief cause for the betterment is the lower temperatures which have prevailed, as well as the approach of the time usually taken for stocking up. On the whole the market is in good shape and operators, jobbers and retailers are looking forward to a better trade during the fall and winter.

Dealers in cities and towns also report a better demand for all grades of domestic coals. The larger consumers are laying in their supply and the retail trade has been active in the extreme. Better weather has enabled the dealer to deliver promptly. Retail prices are firm but have not yet reached the usual winter level.

One of the best features is the continued activity in the Lake trade. Operators are rushing their mines in order to get as large a tonnage as possible to the Northwest before the close of navigation. The tonnage moved to date is larger than usual and it is believed the amount shipped to the Northwest from Ohio will surpass that of last year by many tons. There is little or no congestion on the docks at the upper Lake ports and the movement to the interior is good. Dock prices rule firm.

Production in the various Ohio fields has been rather active during the past week. It is estimated that the output has been about 85 per cent. of normal in the



strictly domestic fields and about 75 per cent. of normal in the other mining districts.

Prices prevailing per ton in Ohio are: Domestic lump in the Hocking Valley, \$1.50; domestic lump in Pomeroy Bend, \$1.60@1.70; ¾-in., \$1.35; nut, \$1.15; mine-run in the Hocking Valley, \$1.05@1.15; mine-run in eastern Ohio, 95c.@ \$1.05; coarse slack, 35@45c.; nut, pea and slack, 40@50 cents.

### Cincinnati, Ohio

The unexpected warm weather is responsible for the domestic stagnation which is now in evidence as well as the weak steam demand. This, however, can be only temporary. The big bulk of the business cannot be seriously affected by temporary and minor conditions which are only incident to the business. The amount of "free" coal—that is, that not contracted for—is estimated variously at 25 to 40 per cent. of the total output. The remaining 60 to 75 per cent. will continue to move right along under contracts signed months ago.

There is an increasing amount of speculation as to what the effect of the threatened labor difficulties will have upon the fuel market. It is generally believed that the difficulties of two years ago will be repeated and probably intensified. The anthracite miners have made known their demands for a 20 per cent. increase in wages.

Just now the stocks of coal are sufficient to keep the demand down to a minimum but in the event of any trouble, whether from labor or other causes which would hinder operations or tie up deliveries, present stocks would soon disappear and the demand would jump at once. It is not believed that demand uninfluenced by some such outside agency will be materially increased before the first of the year. But the determination of men in the local trade seems to be to maintain a neutral position until after the first of the year. The tone of all the offices is optimistic, and they seem to feel that having been for 10 months without material change they must soon come to the proverbial turn in the lane. In some of the offices there is met the declaration that their business has been good under all the circumstances and that they really have "no kick coming."

### Thurmond, W. Va.

Conditions in the New River coalfield, along the Virginian and Chesapeake & Ohio Railways, are in a decidedly mixed-up condition. Operators along the Virginian have an ample car supply and run every day, while the operators dependent on the Chesapeake & Ohio Railway alone are only working about four days a week. Operators in the Chesapeake & Ohio Railway district, who have track connections with the Kanawha, Glen Jean & Eastern

Railroad, popularly known as McKell's road (McKell Coal and Coke Company) and with the White Oak Company's road, both of which now connect with the Virginian, also have an ample car supply and run every day.

Then of the large selling agencies handling the coal from this field, some have large amounts of coal at tidewater and few vessels chartered, while others are short of coal, both at Sewalls Point and Newport News.

During the first ten months of this year, the Virginian Railway dumped over its Sewalls Point piers 1,622,534 tons. This road has just issued a little pamphlet descriptive of its Sewalls Point piers, giving some of the loading records they have made, which are quite remarkable.

As showing how far below their rated capacity the mines in the New River field along the Chesapeake & Ohio Railway are loading, the following statement is given of the four largest mines in the district and what they should have loaded, based on their actual tonnage allotment per day, with twenty-five working days allowed:

Name of Mine Shipping	Tons Actually Loaded	Tonnage- allotment Capacity	Per Cent. of Capacity Loaded
Sun.....	30,870	47,500	65.0
Raleigh.....	17,100	37,500	46.0
Klondike.....	10,410	32,500	50.5
Star.....	13,400	22,500	60.0

### Nashville, Tenn.

Domestic business in this field is entirely satisfactory, with mines working full time, and so far no trouble has shown itself in the way of shortage of cars with the Louisville & Nashville Railroad.

Prices are ranging just about the same as usual at this time of the year, which are as follows per ton:

Standard lump .....	\$1.25
Nut coal .....	\$0.90@1.00
Screenings .....	0.25@0.30

The demand for steam coal is not as good as it might be and the mines making a specialty of furnishing steam plants their requirements, are complaining about the dullness on steam coal. The prevailing price on mine-run coal is from 80@90c. per ton, according to district from which the coal moves.

From this time on it will be strictly a weather-market proposition in this field on domestic coal. A spell of severe weather, lasting for some little time will advance the price on domestic coals; otherwise on account of the large over-production in this field the present price on coal for the season will very likely remain unchanged.

### Louisville, Ky.

A drop in temperature from 74 to 18 degrees in twelve hours in this locality precipitated a raid on the coal deal-

ers. Different retail dealers are advertising a 2000-lb. ton, due to a lively controversy which has occurred in the general council of Louisville, as to what constitutes a ton of coal. Jellico coal is being advertised as low as \$3.60 per ton, Straight Creek, \$3.75, and Kentucky Lump, \$3.75, with Pittsburg at 14c. a bushel. The activity in coal centers in Kentucky is being duplicated in the mining districts as well.

In the western part of the State the inactivity due to the Illinois Central strike is fast disappearing. More cars are being placed at the disposal of the mines with which to handle their coal. In the Middlesborough district there is much activity; this field, while not a new one, continues to develop rapidly.

### Indianapolis

The weather during the last week has been the key to the local market. The first few days of cold weather occasioned some increasing interest and strength, but when followed by warm weather the market lagged and showed weakness. It is apparent that every new touch of winter makes a draft upon the retailer, and directly through him on the wholesaler. These are indications that both consumers and retailers are depending mainly upon the day-to-day supply of coal, adopting this plan of depending on the open market with entire confidence.

Conditions relating to steam coal remain practically unchanged. Manufacturers are still confident that business will soon take an upward turn and trade generally speaking is hopeful. However, the developments of the last few weeks show a depressing effect on the coal trade in general, due, it is said, to the threatened attack by the Government against the big interests, and in particular the Steel Corporation. Because of these and other hindrances, it need not be expected that there will be any perceptible improvement in the steam-coal demand and consumption during the remainder of the year. The operators freely admit that their dependence is placed on whatever profit they may derive from consumers in general. There has been no change in the price of coal since November 1.

### St. Louis, Mo.

Conditions in the St. Louis market were somewhat better the past week, because of the change in the temperature. There had been a slight increase the week previous, but during the last week prices have been practically stationary as a whole. Car supply occasioned a sharp demand on one or two days, but other than that there was nothing extraordinary about the market.

It is almost beyond understanding why the market still hovers around the cost of production price, especially on the inner belt coals. Higher-grade coals from

the outer district advanced slightly and were in fair demand, but the bulk of the tonnage moved to the country.

One extraordinary feature of the present season is the fact that the railroad companies are not buying in the volume that they have heretofore at this time of the year. As a matter of fact, right now a lower price is asked at the rate of 50 bushels of Standard lump coal than for a thousand bushels. This is retailing on track in wagon-load lots at from \$1.50 to \$1.62½ per ton, and the operators are asking \$1 at the mines with a 52c. rate, to which must be added the shrinkage and other losses. This is the first time that anything like this has occurred in years, and there seems to be no immediate remedy for it. The cause of this is laid to one or two of the larger companies in St. Louis, who have the output of the Standard mines, and who are endeavoring to drive the retailers out of the carload business. Indications are that the higher-grade coals will continue to bring a good price, while there is very little hope for coals from the Standard field of the lower grade.

The prevailing prices per ton are as follows:

*Standard:*

2-in. lump.....	\$0.95@ \$1.05
6-in. lump.....	1.00@ 1.10
No. 1 nut.....	0.75
No. 2 nut.....	0.60
2-in. slack.....	0.30

The Mount Olive and Staunton coals are still selling at from \$1.25 to \$1.35, and the higher-grade coals from the inner belt are selling at from \$1.75 to \$2.10.

*Franklin County Coal:*

6-in. lump.....	\$1.60@ \$1.75
3x6-in. egg.....	1.60@ 1.75
No. 1 nut.....	1.50
No. 2 nut.....	1.30
No. 3 nut.....	1.00

*Williamson County Coals (Carterville):*

6-in. lump.....	\$1.50@ \$1.65
3x6-in. egg.....	1.45@ 1.60
No. 1 nut.....	1.15@ 1.25
No. 2 nut.....	1.00@ 1.10
No. 3 nut.....	0.90
2-in. screenings.....	0.45
Mine-run.....	1.00

## Minneapolis—St. Paul

There is a splendid tone to the retail market. The time was when the Twin Cities coal supply came altogether from the head of the Lakes docks, but for several years past, the all-rail coal from Illinois, principally Southern Illinois, has found a large place in the domestic market. All-rail coal is also used to a considerable extent in the steam trade.

There has been no change in dock coal prices, anthracite remaining at \$9 for stove and egg, chestnut at \$9.25, pea at \$7.75, buckwheat at \$6.25, delivered in consumers' bins. Hocking, \$5.75, Youghiogeny, \$5.75. All-rail, washed nut and stove \$5.50. Smokeless \$7.25.

Carload prices for domestic coal are firm on dock coal, \$3.50 for Hocking and Youghiogeny at Duluth-Superior docks. All-rail coals are held very firm at

mines, Franklin county lump and egg and No. 1 at \$1.75, and stove and washed egg, \$2; No. 2 at \$1.50, sometimes called special stove.

Carterville lump and egg, about \$1.75; washed egg \$2; washed nut \$1.75. Coals from Springfield and vicinity are held at \$1.75 for egg and \$1.50 for washed nut.

## Portland, Ore.

Australia coal to the extent of 6000 tons was brought here this week by the British steam "Strathearn," from Newcastle, N. S. W. This is the first coal cargo to arrive here this season from Australia, and it will not be followed by more than the four or five vessels now listed. The importation of Australian coal to this port has decreased materially during the past five years, due largely to the introduction of domestic coals. About seven years ago the importation for one season amounted to approximately 70,000 tons. The fact that the railroads and steamboats are using oil fuel extensively is also responsible for the decreased shipments from Australia.

The weather of the past week has been more favorable to the fuel dealer, although by no means such as to create a sudden demand for coal.

Following are the prices asked here per ton, including cost of delivery to points within the city proper:

Japanese.....	\$7.50
Washington lignite.....	\$7.00@ 7.50
Australian.....	10.00@ 10.50
Rock Springs, Wyo.....	10.00@ 10.50 nut \$9.50
Diamond, Wyo.....	10.00
Carbon Hill, Wash., lump.....	10.50
Carbon Hill, steam.....	7.50
Newcastle, Wash.....	7.00
Beaver Hill, Ore.....	9.00@ 9.25
Blacksmith coal.....	17.00

## San Francisco

The arrivals for the week by water are limited to one cargo from Australia of 3739 tons. Notwithstanding the light arrivals, and providing there are no mine strikes, accidents or lockouts, we see no cause for apprehension in this market. There are ample supplies of Australian to meet all existing demands.

Domestic consumers are favored with continued mild weather, no rain or cold weather having visited this section for more than a month.

The mines of the Puget Sound and British Columbia districts, from which most of our coal is received, are working full time, with increased output, and have a local demand for nearly all they produce, making them comparatively independent of this market. Prices are firm, with no immediate prospect of change, and the demand is quite satisfactory, considering weather conditions.

The car shortage referred to last week still continues and the dealer with a confirmed habit of living on the "hand-to-mouth" policy is registering his usual inconsistent "kick."

The wholesale prices, ex-bunker or at ship's side, are as follows, per short ton:

Wellington, clean.....	\$8.00
Wellington, average.....	7.50
Australian, clean.....	8.00
Australian, average.....	7.50
Puget Sound, clean.....	6.50
Puget Sound, steam.....	\$5.00 and 5.50
Pennsylvania anthracite.....	15.00
Colorado anthracite.....	12.50
New Mexico anthracite.....	13.50
Anthracite briquets.....	10.00
Cumberland, smithing.....	12.50
Utah, Wyoming and New Mexico, clean (for domestic use only).....	\$9.00 and 8.00

## Foreign Markets

### GREAT BRITAIN

On the whole the coal trade of the British Isles has shown a little more activity, but delivery orders are by no means large. This has not had any tendency to reduce the prices, either those publicly advertised or the whole pit prices, and with the heavy accumulations of back orders disappearing the collieries are not averse to hold up a reserve supply in view of the demands winter will necessarily make. It seems too that the winter demand will be brisk, as the weather has certainly given many indications of a hard fall and winter. The Newcastle and Durham markets are firm, prompt and vigorous, and steam coals at Durham are in brisk demand. The house-coal trade of Lancashire is in good demand, while in the South Wales district the greatest attention is being given to the acquisition of the Welsh Navigation Coal Company's interests by Messrs. D. Davis & Sons, Ltd. This combination is one of the most important in the trade effected in recent years and the progress of the combine will be watched with interest. Some prophets have already been forecasting a huge combination of all the coal interests in South Wales. The Scottish Coal trade continues active in all branches as does the trade in South Yorkshire.

Chartered tonnage continues to arrive fairly well, and with a better demand for large coals over the remainder of the year, prices are stiffening. More attention is also being paid to contracting over next year. Quotations are approximately as follows:

Best Welsh steam coal.....	\$4.08@ \$4.14
Seconds.....	3.84@ 3.90
Thirds.....	3.63
Best dry coals.....	3.96
Best Monmouthshire.....	3.66@ 3.69
Seconds.....	3.54@ 3.57
Best Cardiff small steam coal.....	1.92@ 1.98
Seconds.....	1.80@ 1.86

The above prices for Cardiff coals are all f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both exclusive for wharfage and for cash in 30 days, less 2½ per cent.

### SPAIN

Imports of coal into Spain for the eight months ended Aug. 31 were 1,398,060 metric tons, an increase of 50,031 tons over 1910; imports of coke, 206,464 tons, an increase of 16,261 tons. Substantially all these imports come from Great Britain.